CDJ-500

SERVICE MANUAL

US Model
Canadian Model

Model Name Using Similar Mechanism	NEW
CD Mechanism Type	CDM-56
Base Unit Type	BU-24
Optical Pick-up Type	SPU3212

SPECIFICATIONS

Capacity
Number of drive
1
Number of slots
51
Total Capacity
33.15 GB

Changer Performance
Disc Exchange Time
Typ. 22 sec. (average)

Drive Performance
Sustained Transfer Rate[1)]
1800-3600 KB (P-CAV)
Access Time
Typ. 90 ms (average)

Interface
Changer
SCSI-2 single ended
Drive
SCSI-2 single ended
Analog Audio Output

Jack type	Phono jacks
Rated output	0.75 V rms at 47 kilohms
Load impedance	Over 10 kilohms

Digital Audio Output (optical)

Jack type	Square optical connector jack
Rated output	–18 dBm
Wave length	660 nm

Applicable Disc
CD disc, CD-R disc, CD-RW disc
Disc diameter: 4 3/4 in. (12 cm)

Readable Format
CD-Digital Audio
CD-ROM (Mode 1)
CD-ROM XA (Mode2Form1 and Mode2Form2)
CD-EXTRA
Photo CD (Single and multiple session)

General
Power requirements
120 V AC, 60 Hz
Power consumption
0.26 A
Dimension (approx.) (w/h/d)
When the door is closed:
17 × 7 1/4 × 12 1/8 in. (430 × 182.5 × 306 mm) incl. projection parts
When the door is open:
17 × 7 1/4 × 17 in. (430 × 182.5 × 430 mm) incl. projection parts
Mass (approx.)
14 lb 12 oz (6.7 kg)
Environmental conditions

Operating temperature	41 °F to 95 °F (5 °C to 35 °C)
Operating humidity	30% to 80% (noncondensing)

Supplied accessories
Audio cord (2 phono plugs – stereo mini plug) (1)
SCSI cable (1)
SCSI card (1)
CD-ROM (1)

Design and specifications are subject to change without notice.

CD-ROM CHANGER

MICROFILM

SONY®

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270˚C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:
Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

The AC leakage from any exposed metal part to earth Ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

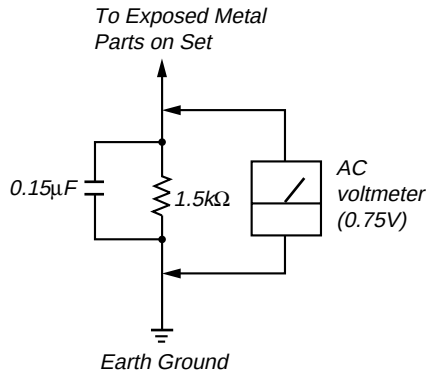

Fig. A. Using an AC voltmeter to check AC leakage.

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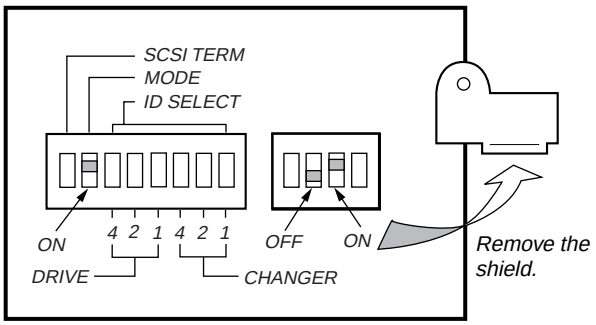
SECTION 1
SERVICE NOTE

LOADING IN/OUT AGING

Loading in and loading out are repeatedly carried out in this aging mode.
Operations are stopped when an error occurs. (When loading in or loading out took more than 6 seconds.)

Procedure:

1. Set the DIP switches on the back panel as shown below.



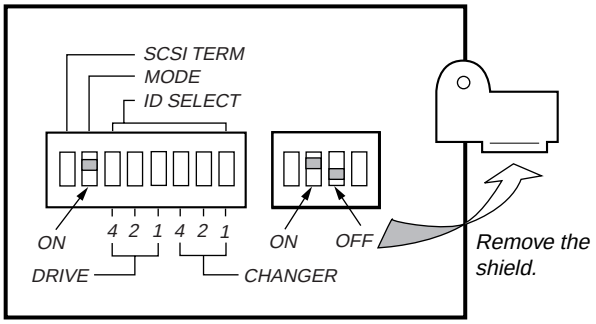
2. While pressing the OPEN button, DISC SKIP – button, and DISC SKIP + button simultaneously, press the ⏻ button to turn ON the power. When the CHANGER indicator starts to blink, release the OPEN, DISC SKIP – and DISC SKIP + buttons.
3. The front door opens automatically. Set one disc in any slot.
4. Close the front door.
5. Loading in and loading out of the disc are repeated.
6. To end, press the ⏻ button to turn OFF the power.

DISC TABLE AGING

* This mode is used for operating the disc table randomly.
  Operations will continue unless an error occur.

Procedure:

1. Set the DIP switches on the back panel as shown below.



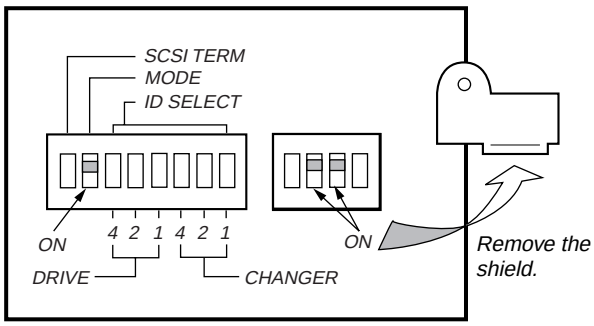
2. While pressing the OPEN button, DISC SKIP – button, and DISC SKIP + button simultaneously, press the ⏻ button to turn ON the power. When the CHANGER indicator starts to blink, release the OPEN, DISC SKIP – and DISC SKIP + buttons.
3. The front door opens automatically.
4. Close the front door to start aging.
5. To end aging, press the OPEN button.

TOTAL AGING

This mode is used for executing loading in and loading out of discs in any slits sequentially.
Operations are stopped when an error occurs.

Procedure:

1. Set the DIP switches on the back panel as shown below.



2. While pressing the OPEN button, DISC SKIP – button, and DISC SKIP + button simultaneously, press the ⏻ button to turn ON the power. When the CHANGER indicator starts to blink, release the OPEN, DISC SKIP – and DISC SKIP + buttons.
3. The front door opens automatically. Set discs in any slot.
4. Close the front door to start aging.
5. During aging, operations are repeated in the order of “rotation of disc table” → ”loading in” → ”disc access” → ”loading out” → ”rotation of disc table”.
6. To end aging, press the OPEN button .

CHECKING OPERATIONS USING THE FIELD50.EXE PROGRAM

- When this program is executed, the operations of each part are checked so that faulty parts can be investigated during repairs. It is recommended that this program is executed before returning the unit to the customer after completing repairs and that all test items are checked that they are satisfactory.
  An instruction manual in PDF file format describing the details is provided with the program file. Refer to this manual for further details.

Preparations:

- IBM PC compatible Personal computer and display:
  Use a personal computer with an HDD
- OS;
  MS-DOS or PC-DOS version 5.0 or later.
- Floppy disk with latest "FIELD50.EXE" software (Includes the instruction manual (FIELD50.PDF)) (CDJ-001:J-2501-172-A)
- SCSI board;
  The "Adaptec AVA-2904E" provided with the unit is recommended. If this is not available, use an equivalent.
- Setting the ASPI manager
  Install the "ASPI manager" suitable for the SCSI board, and rewrite the "CONFIG. SYS" file. (Refer to the following procedure.)
  ASPI managers (In the case of Adaptec products)

SCSI Board	ASPI Manager
AVA-2904E	Aspi8dos. sys
AHA-1510B	Aspi2dos. sys
AHA-1542CF	Aspi4dos. sys
AHA-2940AU	Aspi8dos. sys

- General CD-ROM
- SONY test disc (TGRS-21: Green disc) (J-2501-110-A)
- SCSI cable
- Speakers with amplifier or equivalent. (Use only when checking the AUDIO output)

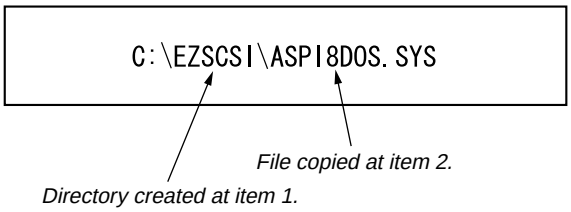
Installing the "FIELD50.EXE":

1. Create the directory "CDJC50S" in the C drive of the PC used, and copy the "FIELD50.EXE" file there.
2. Create another directory "DATA" in the directory created in step 1.

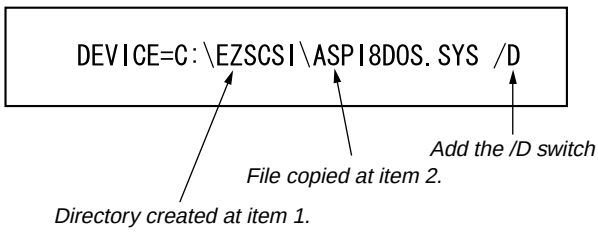
```
C:\CDJC50S\FIELD50.EXE
    └─ DATA
```

Installing the "ASPI manager":

1. Create the desired directory in the C drive. The "EZSCSI" directory is explained here as an example.
2. Copy the file of the ASPI manager corresponding to the directory created in step 1. The "ASPI8DOS.SYS" file is explained here as an example.



3. Edit the "CONFIG.SYS" file and add the device so that the file copied at 2 is referred to.



Note:

ASPI manager version

Operations of the "FIELD50.EXE" program are guaranteed when the following ASPI manager version is used. Operations using other ASPI managers are not guaranteed.

ASPI manager	Usable Version			
Aspi2dos. sys	3.661J	3.68	3.68s	-------
Aspi4dos. sys	3.34	3.35	3.36s	3.36s
Aspi8dos. sys	1.26	1.32	1.32s	1.32s

Connection

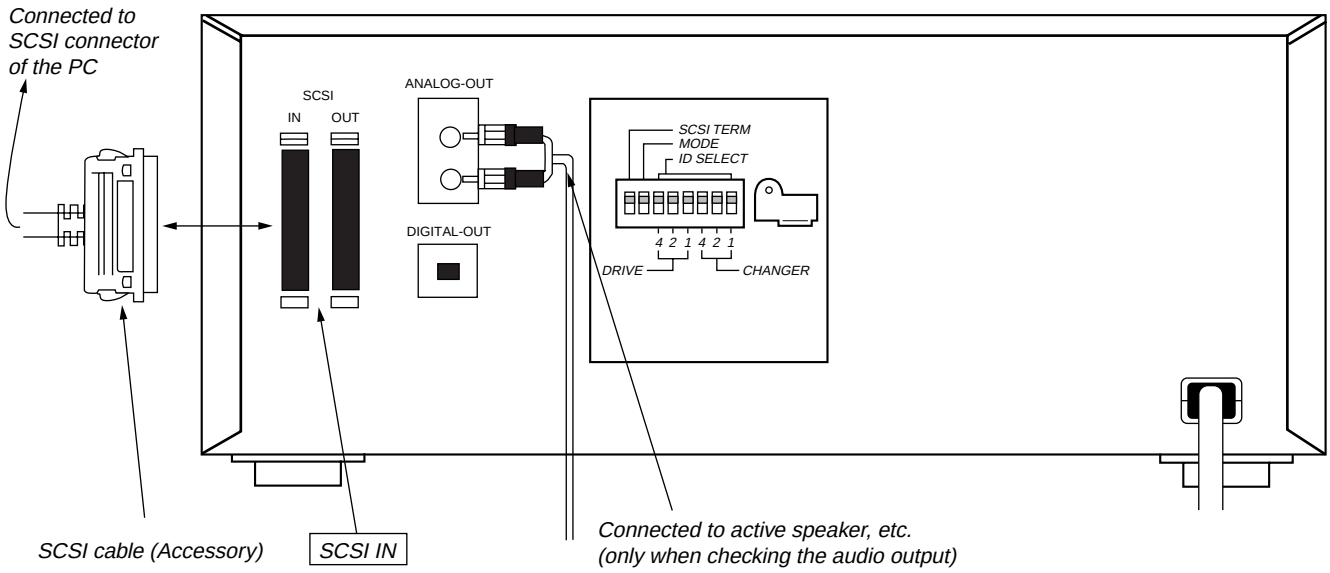


Fig. Connection of equipment

Setting

• DIP switch settings

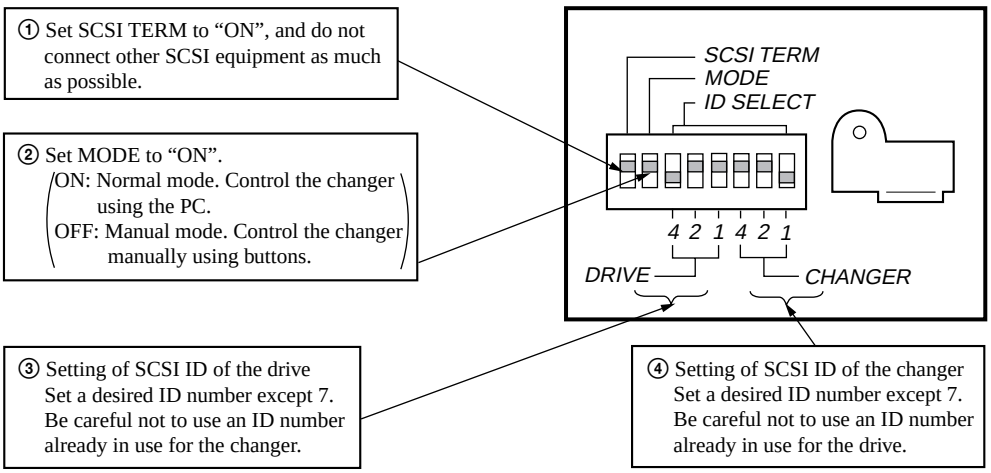

① Set SCSI TERM to “ON”, and do not connect other SCSI equipment as much as possible.
② Set MODE to “ON”.
(ON: Normal mode. Control the changer using the PC.
OFF: Manual mode. Control the changer manually using buttons.)
③ Setting of SCSI ID of the drive
Set a desired ID number except 7.
Be careful not to use an ID number already in use for the changer.
④ Setting of SCSI ID of the changer
Set a desired ID number except 7.
Be careful not to use an ID number already in use for the drive.
SCSI TERM
MODE
ID SELECT
4 2 1 4 2 1
DRIVE
CHANGER

Fig. DIP Switch Setting

Operating procedure:
Note:
Operations of this program are not guaranteed when used in the DOS prompt mode with starting up Windows.
Refer to the instruction manual of the PC used, set the DOS prompt mode, and execute the program.

1. Turn on the power of the PC and set the DOS prompt mode.
2. Change the directory to “CDJC50S”.

```
C:\CDJC50S>
```

3. Enter “FIELD50” and press the ENTER key.”

```
C:\CDJC50S>FIELD50
```

4. If directory for storing the data is not available, enter “Y” at the following screen and press the ENTER key.

```
DIRECTORY/C:\CDJC50S\DATA isn't exist.
Create directory [Create=Y/No=N]?
```

5. The following screen appears.

```
LOG file name [TEST_001]=
```

Default file name
(Suffix number of file name will increase automatically)

Enter a desired file name using less than 8 characters.
(If numbers are used for the suffix of the file name, these will be counted up automatically the next time.)
When only the ENTER key is pressed, the default file name will be set.
This file will be saved as the log file in the directory “DATA”.
After entering the file name, press the ENTER key.

6. If a file name already used once is specified, the following screen appears. Enter “Y” or “N” according to whether to overwrite the file, and press the ENTER key.

```
FILE:TEST_001 is already exist.Overwrite [Y/N]?
```

The following screen appears when the file name is not already in use.

```
======== Inquiry ========
ID      DeviceType     Vendor   Product          Revision
0         < Selection Timeout >
1         < Selection Timeout >
2         < Selection Timeout >
3       CD-ROM         SONY     CD-ROM CDU625    1.0y
4         < Selection Timeout >
5         < Selection Timeout >
6       Media Changer  SONY     CDJ-C50S/500     1.01

======== CDJ Device Structure ========
Device           ID     Vendor   Product          Revision
Media Changer    6      SONY     CDJ-C50S/500     1.01
   + CD-ROM      3      SONY     CD-ROM CDU625    1.0y

  Select Media Changer ID[6] or End[E]?
```

The SCSI ID of the changer detected is displayed as the default value.

For example, as the ID of the changer is set to “6” and the ID of the drive is set to “3”, these values will be displayed.
Enter “6” for the ID of the media changer to be checked using this program, and press the ENTER key.

7. The following screen appears. Enter the serial number of the unit and press the ENTER key.

```
Checking Media Changer ID6
Serial No. =
```

Enter the serial number of the unit.

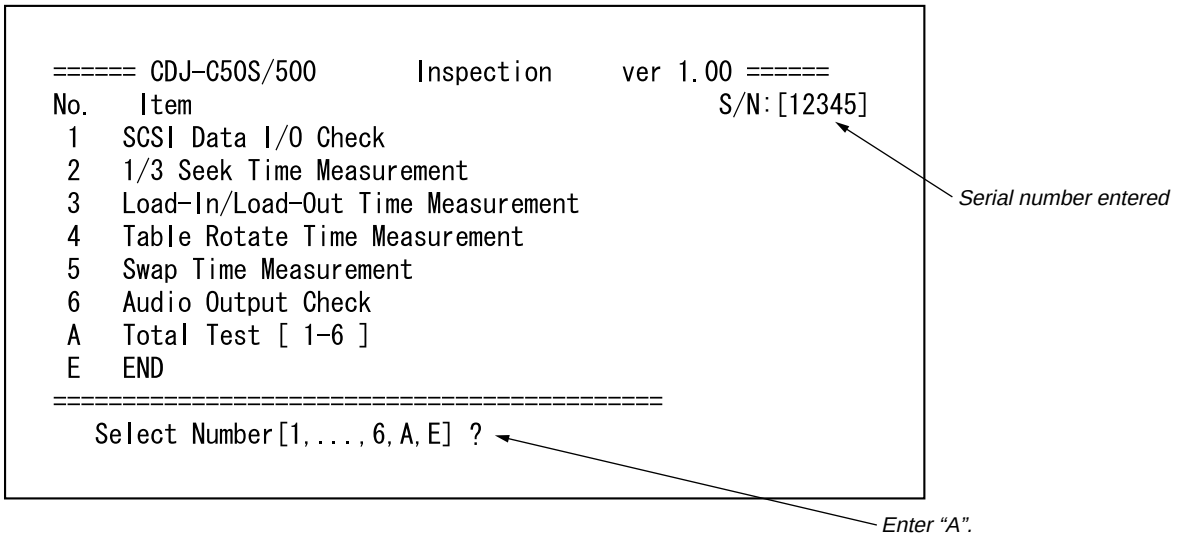
8. The number of the slot set with a disc will be displayed. The screen asks whether the inspection is started. Enter “Y” and press the ENTER key.

```
06/08/99  15:02:11

---------- Media Mapping ----------
Discs are present in the followings.
Door Closed
--- --- 003 --- --- --- --- --- --- ---
011 --- --- --- --- --- --- --- --- ---
--- --- --- --- --- --- --- --- --- ---
--- --- --- --- --- --- --- --- --- ---
--- --- --- --- 045 --- --- --- --- ---
051


Execute the Inspection CDJ-C50S/500   [Y/N]?
```

Displays the slot number (s) holding a disc.
(If all slots are empty, — will be displayed.)

Enter Y.

9. The following screen appears. These inspection items can be excuted one by one. The following describes the example of executing all the tests. Enter “A” to execute all the inspection items and press the ENTER key.



10. The following screen appears and the front door opens automatically. Insert the general CD-ROM into the 14th slot, and close the door.

```
Insert CD-ROM DISC into Slot14
and close the Door.
```

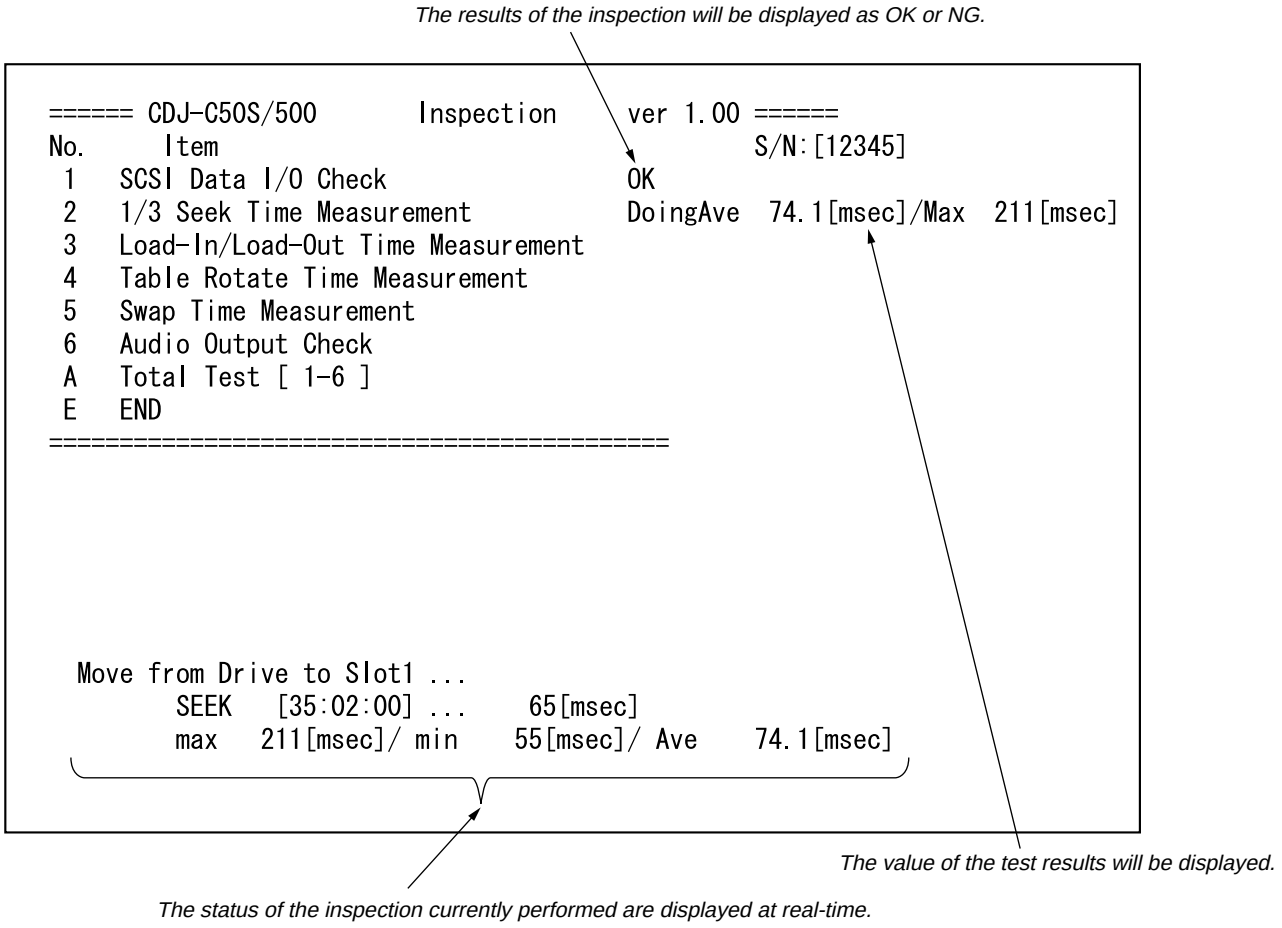
11. The following screen appears and the front door opens automatically. Insert the SONY test disc (TGRS-21: Green disc) in the 1st slot, and close the door.

```
Insert GREEN(TGRS-21) DISC into Slot 1.
and close the Door.
```

Take note that if the door is closed without inserting any disc, the following screen appears and tests end.

```
Can't find TEST DISCs
Can't Continue Inspection.
 == Inspection Terminated. ==
```

12. When the inspections are executed, the status will be displayed at the bottom of the screen. The results of each inspection will be displayed on the right side of the screen.


The results of the inspection will be displayed as OK or NG.
====== CDJ-C50S/500 Inspection ver 1.00 ======
No. Item S/N:[12345]
1 SCSI Data I/O Check OK
2 1/3 Seek Time Measurement DoingAve 74.1[msec]/Max 211[msec]
3 Load-In/Load-Out Time Measurement
4 Table Rotate Time Measurement
5 Swap Time Measurement
6 Audio Output Check
A Total Test [1-6]
E END
Move from Drive to Slot1 ...
SEEK [35:02:00] ... 65[msec]
max 211[msec]/ min 55[msec]/ Ave 74.1[msec]
The value of the test results will be displayed.
The status of the inspection currently performed are displayed at real-time.

13. The following appears at the bottom of the screen. Check the audio signal here. During this test, analog audio signals are output from the ANALOG OUT and digital audio signals from the DIGITAL OUT.
Check the sounds according to the instructions on the screen.

```
Connect Amplifier to ANALOG-OUT and DIGITAL-OOT
 Hit [Space] Key to Play Left Channel
```

After completing preparations to check the sounds, press the space key.

14. When the following screen appears, the 1 KHz sine wave is output from the L-CH. Enter “Y” and press the ENTER key if OK. If no sounds are produced from the L-CH or produced from R-CH, enter “N” and press the ENTER key for negative.

```
Connect Amplifier to ANALOG-OUT and DIGITAL-OOT
 Now Playing Left Channel(1kHz SINE Wave)  Good[Y] or NG[N] ?
```

After checking, enter “Y” or “N”.

15. The following screen appears at the bottom, and 1 KHz sine wave is out put from the R-CH. If OK, enter “Y” and press the ENTER key. Like in step 14, enter “N” and press the ENTER key if negative.

```
Connect Amplifier to ANALOG-OUT and DIGITAL-OOT
 Now Playing Left Channel(1kHz SINE Wave)  Good[Y] or NG[N] ? Y
 Now Playing Right Channel(1kHz SINE Wave) Good[Y] or NG[N] ?
```

After checking, enter “Y” or “N”.

16. The following screen appears and the results of each test are displayed.
If the test results are satisfactory, “OK” will be displayed. For details on the test results, refer to the PDF file provided with the “FIELD50.EXE” software.

```
====== CDJ-C50S/500        Inspection     ver 1.00 ======
No.      Item                                    S/N:[12345]
 1   SCSI Data I/O Check                  OK
 2   1/3 Seek Time Measurement            OK   Ave  74.8[msec]/Max  316[msec]
 3   Load-In/Load-Out Time Measurement    OK   In:  15.0[sec] /Out:  2.2[sec]
 4   Table Rotate Time Measurement        OK   Ave   2.2[sec] /Max   2.3[sec]
 5   Swap Time Measurement                OK   Ave  21.9[sec] /Max  22.3[sec]
 6   Audio Output Check                   OK
 A   Total Test [ 1-6 ]
 E   END
=============================================
   Select Number[1,...,6,A,E] ?
```

To end, enter “E”, or to continue, enter the corresponding number.

17. If there is a inspection to be executed again, enter the corresponding number and press the ENTER key. To end, enter “E” and press the ENTER key.
18. The following screen appears at the bottom left of the screen. Remove the disc and close the front door.

```
== Inspection Terminated. ==
 Please Remove TEST CDs in Slot 1&14,
 and Close Door.
```

19. The program is completed, and the following will be displayed.

```
C:\CDJC50S>
```

Referring to the Log File:

• The results executing “FIELD50.EXE” are stored as the log file. This file is the file name entered at step 5. To see this file on the screen, enter the following:

```
C:\CDJC50S>TYPE C:CDJC50S\DATA\(Log file)
```

• If no problems occurred, the following will be displayed.

```
------------------------------------------------------------------------------
            Field inspection for CDJ-C50S/500          <Ver 0.50>
------------------------------------------------------------------------------
Log file name:[TEST_001]
------------------------------------------------------------------------------
<SCSI>
======== Inquiry ========
Board:[ADAPTEC AIC-7870], Manager:[DOS SCSIMGR 1.26]
ID      DeviceType     Vendor   Product          Revision
0         < Selection Timeout >
1         < Selection Timeout >
2         < Selection Timeout >
3       CD-ROM         SONY     CD-ROM CDU625    1.0y
4         < Selection Timeout >
5         < Selection Timeout >
6       Media Changer  SONY     CDJ-C50S/500     1.01

======== CDJ Device Structure ========
Device           ID     Vendor   Product          Revision
Media Changer    6      SONY     CDJ-C50S/500     1.01
   + CD-ROM      3      SONY     CD-ROM CDU625    1.0y
====================================
------------------------------------------------------------------------------
<CDJ-C50S/500>
Serial Number:12345
F/W:          Ver. 1.01
Inspection:   06/09/99  09:14:43
------------------------------------------------------------------------------
------------------------------------------------------------------------------
<Mapping>
---------- Media Mapping ----------
Discs are present in the followings.
Door Closed
001 --- 003 --- --- --- --- --- --- ---
--- --- --- 014 --- --- --- --- --- ---
--- --- --- --- --- --- --- --- --- ---
--- --- --- --- --- --- --- --- --- ---
--- --- --- --- 045 --- --- --- --- ---
051


------------------------------------------------------------------------------
<Inspection>

Select Item -> [a] (09:14:47)
- SCSI Data I/O Check -
GOOD

------- 1/3 Seek Time Measurement --------
max   100[msec]/ min    57[msec]/ Ave    73.5[msec]

------- Load-In/Out Time Measurement -------
  Load-In  :    15.5[sec]
  Load-Out :     2.2[sec]

------- Table Rotate Time Measurement -------
max     2.3[sec]/ min     2.0[sec]/ Ave     2.2[sec]

------- Swap Time Measurement --------
max    22.0[sec]/ min    21.5[sec]/ Ave    21.8[sec]

- Audio Output Check -
GOOD[Left]
GOOD[Right]
```

File name entered at step 5.

SCSI bus device

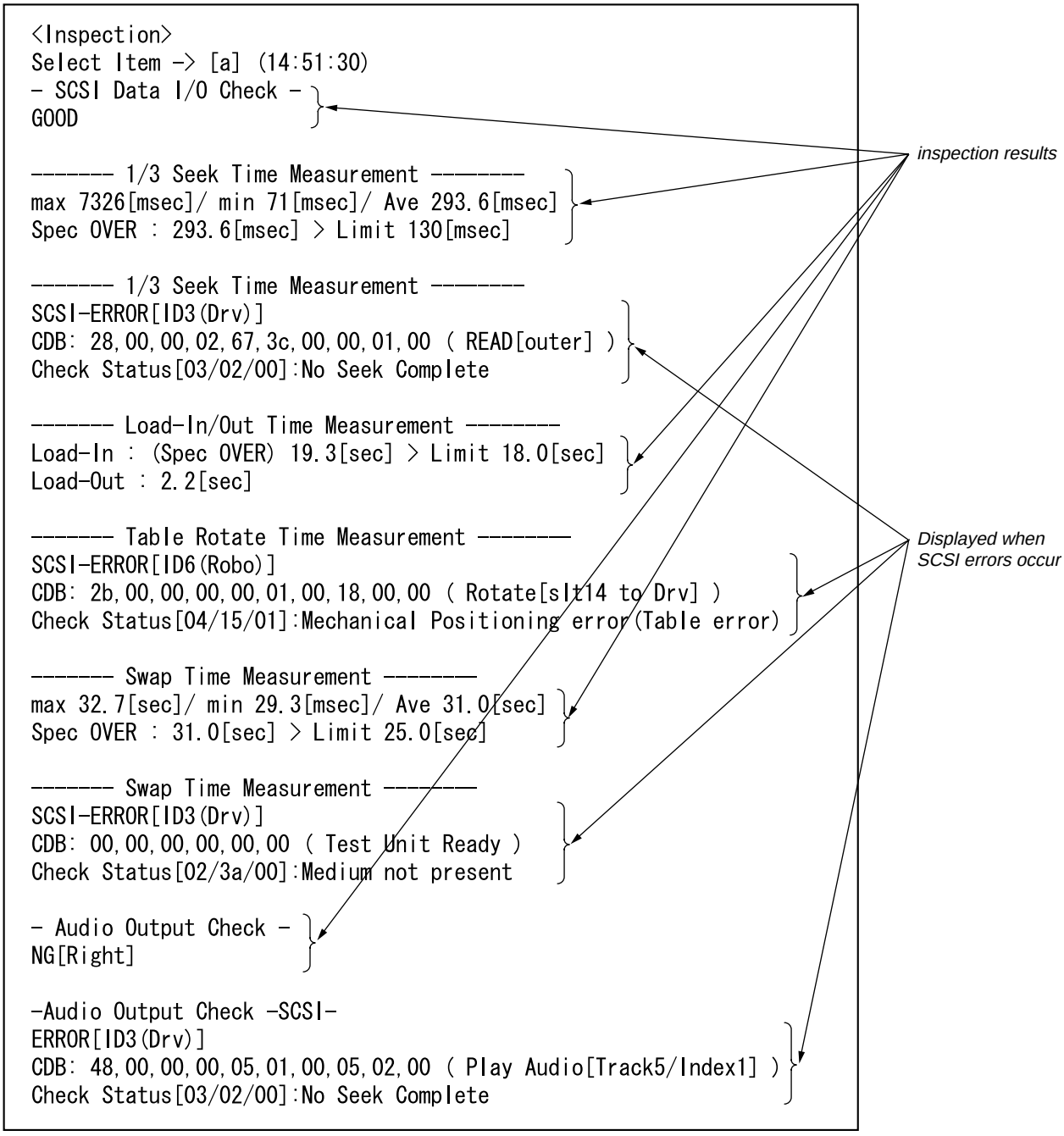
Structure of this unit detected on the SCSI bus

Serial number entered at step 7.

Slot number (s) holding a disc.

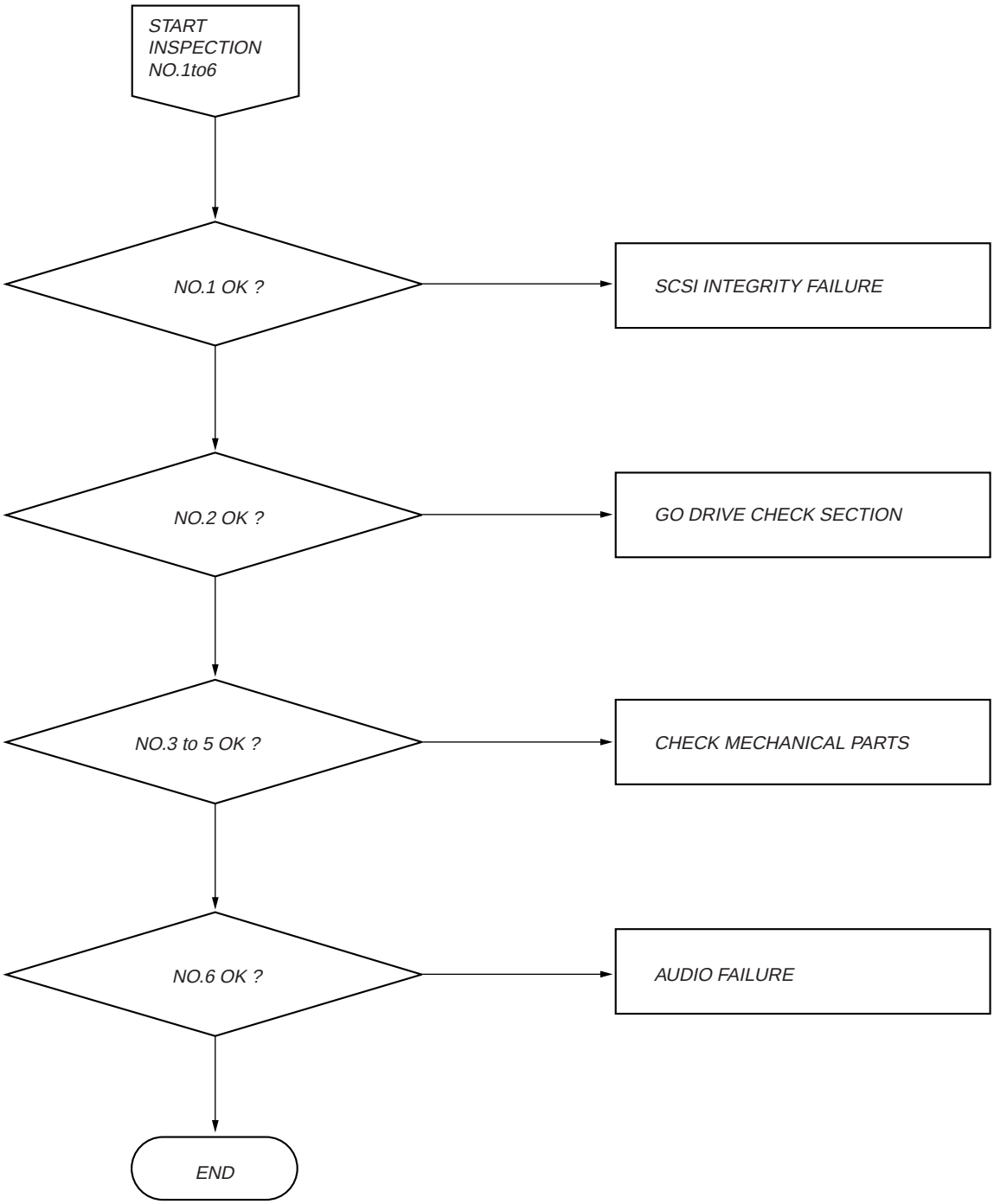
Test results

• When an error has occurred, the following is displayed


<Inspection>
Select Item -> [a] (14:51:30)
- SCSI Data I/O Check -
GOOD
-------- 1/3 Seek Time Measurement ---------
max 7326[msec]/ min 71[msec]/ Ave 293.6[msec]
Spec OVER : 293.6[msec] > Limit 130[msec]
-------- 1/3 Seek Time Measurement ---------
SCSI-ERROR[ID3(Drv)]
CDB: 28,00,00,02,67,3c,00,00,01,00 (READ[outer])
Check Status[03/02/00]:No Seek Complete
-------- Load-In/Out Time Measurement ---------
Load-In : (Spec OVER) 19.3[sec] > Limit 18.0[sec]
Load-Out : 2.2[sec]
-------- Table Rotate Time Measurement ---------
SCSI-ERROR[ID6(Robo)]
CDB: 2b,00,00,00,00,01,00,18,00,00 (Rotate[slt14 to Drv])
Check Status[04/15/01]:Mechanical Positioning error(Table error)
-------- Swap Time Measurement ---------
max 32.7[sec]/ min 29.3[msec]/ Ave 31.0[sec]
Spec OVER : 31.0[sec] > Limit 25.0[sec]
-------- Swap Time Measurement ---------
SCSI-ERROR[ID3(Drv)]
CDB: 00,00,00,00,00,00 (Test Unit Ready)
Check Status[02/3a/00]:Medium not present
- Audio Output Check -
NG[Right]
-Audio Output Check -SCSI-
ERROR[ID3(Drv)]
CDB: 48,00,00,00,05,01,00,05,02,00 (Play Audio[Track5/Index1])
Check Status[03/02/00]:No Seek Complete
inspection results
Displayed when SCSI errors occur

For details of the error codes displayed here, refer to the PDF file of the instruction manual provided with the “FIELD50.EXE” program.

TROUBLE SHOOTING FLOW


START
INSPECTION
NO.1to6
NO.1 OK ?
SCSI INTEGRITY FAILURE
NO.2 OK ?
GO DRIVE CHECK SECTION
NO.3 to 5 OK ?
CHECK MECHANICAL PARTS
NO.6 OK ?
AUDIO FAILURE
END

CHECK POINT

POWER FAILURE
- POWER MOUNT
- FILTER MOUNT
- POWER CORD
- POWER HARNNES

SCSI FAILURE(except CDU-625)
- MAIN MOUNT
- SCSI IN/OUT MOUNT
- D.SW MOUNT
- SCSI FFC CABLE
- HARNNES(MAIN to D.SW)

HARDWARE ERROR

Check it out according to the sense code in the caution message,
There are 6 cases, as follows.

1. Mount Error (sense code 04-53-80)
   - MAIN MOUNT
   - MOTOR MOUNT
   - PICKER
   - HARNNES(MAIN to MOTOR)

2. Un mount Error(sense code 04-53-81)
   Equivalent to 1

3. Disc Sensor Error
   - DISC SENSOR ADJUSTMENT
   - DISC SENSOR (S/R) MOUNT
   - MAIN MOUNT
   - HARNNES(MAIN to DISC SENSOR(S))

4. Drive Chuck Error(04-53-83)
   - MAIN MOUNT
   - DRIVE UNIT
   - FFC (MAIN to MAC-30)

5. Drive Unchuck Error(04-53-84)
   Equivalent to 4

6. Door Motor Error(04-53-85)
   - D.MOTOR MOUNT
   - MAIN MOUNT
   - HARNNES (MAIN to D.MOTOR)

KEY FAILURE
- KEY MOUNT
- HARNNES (MAIN to KEY)

DISC SENSOR FAILURE
- DISC SENSOR ADJUSTMENT
- DISC SENSOR (S/R) MOUNT
- MAIN MOUNT
- HARNNES(MAIN to DISC SENSOR(S))

SCSI INTEGRITY FAILURE
- CSI TERMINATOR (SCSI OUT MOUNT)
- SCSI CABLE LENGTH

CHECK MECHANICAL PARTS
- MECHANICAL MAINTENANCE and ADJUSTMENT

AUDIO FAILURE
- P.JACK MOUNT
- MAC-30 MOUNT
- AUDIO HARNNES

DOWNLOADING THE CHANGER PROGRAM USING THE UPDATEF.EXE PROGRAM

• Execute this program to rewrite the program of the changer of this unit.

Preparations:

• IBM PC compatible Personal computer and display:
Use a personal computer with an HDD
• OS:
MS-DOS or PC-DOS version 5.0 or later.
• Floppy disk with latest UPDATEF.EXE software
(Includes the instruction manual (UPDATEF.PDF)) (CDJ-002:J-2501-175-A)
• SCSI board;
The "Adaptec AVA-2904E" provided with the unit is recommended.
If this is not available, use an equivalent.
• Setting the ASPI manager;
For details, refer to "Installing the ASPI manager" on page 5.
• SCSI cable

Connection:

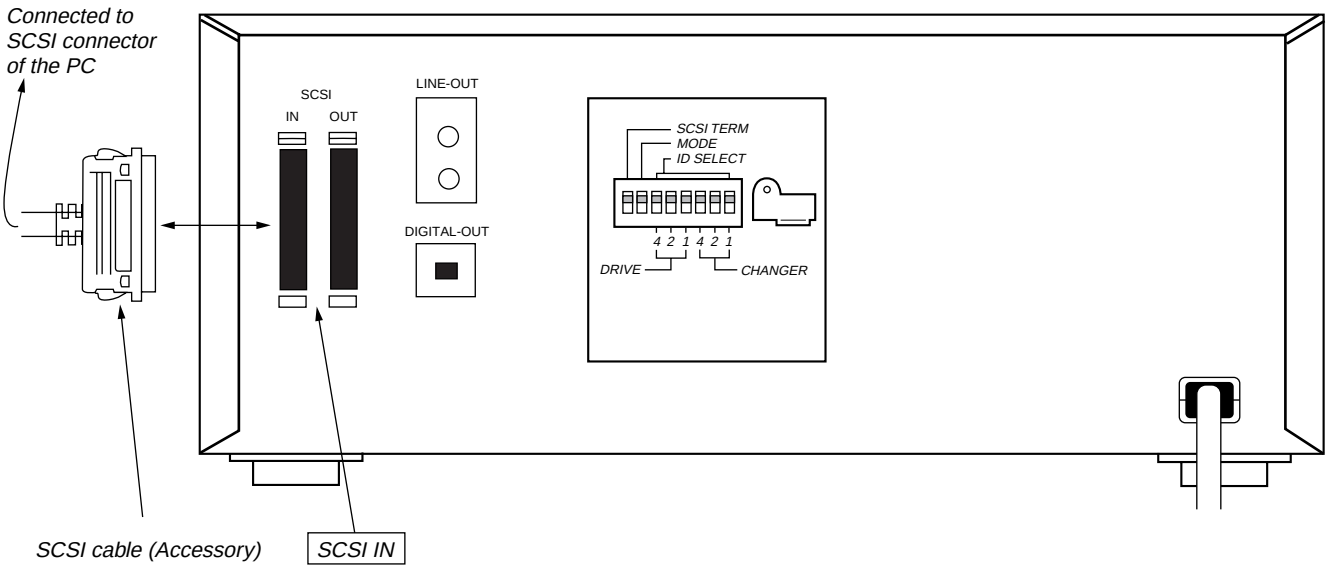
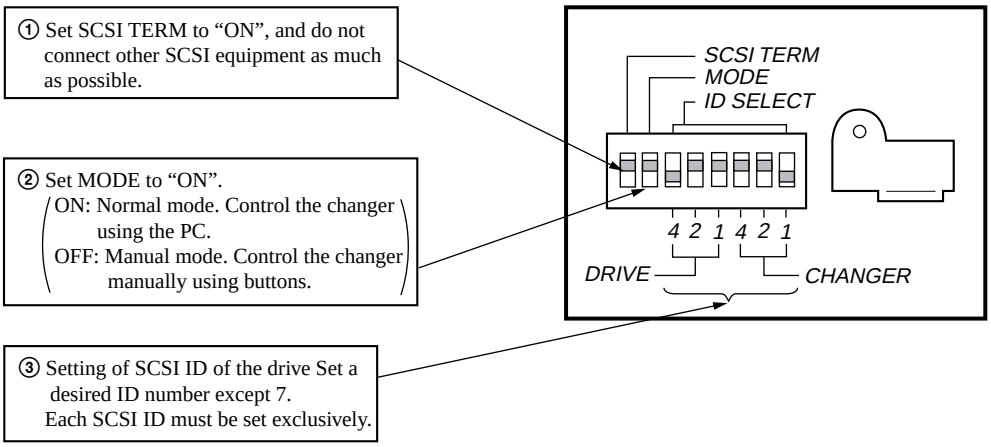


Fig. Connection of equipment

Setting:

• DIP switch settings


① Set SCSI TERM to "ON", and do not connect other SCSI equipment as much as possible.
② Set MODE to "ON".
(ON: Normal mode. Control the changer using the PC.
OFF: Manual mode. Control the changer manually using buttons.)
③ Setting of SCSI ID of the drive Set a desired ID number except 7.
Each SCSI ID must be set exclusively.
SCSI TERM
MODE
ID SELECT
4 2 1 4 2 1
DRIVE
CHANGER

Operations:

1. Create a desired directory in the C drive of the PC, and copy the UPDATEF.EXE file and the HEX file supplied with it there (e.g. XXXXXX.HEX).
   (The following assumes that the "CDJC50S" directory is created.)
2. The download program can be executed on Windows 95/98 running. Close all applications first. The following describes the state where the DOS prompt is excuted from Windows 98. The following screen appears.

```
Microsoft(R) Windows 98
   (C)Copyright Microsoft Corp 1981-1998.

C:\WINDOWS>
```

3. Enter "CD \CDJC50S" and press the ENTER key. (The following screen appears.)

```
C:\WINDOWS>CD  \CDJC50S

C:\CDJC50S>
```

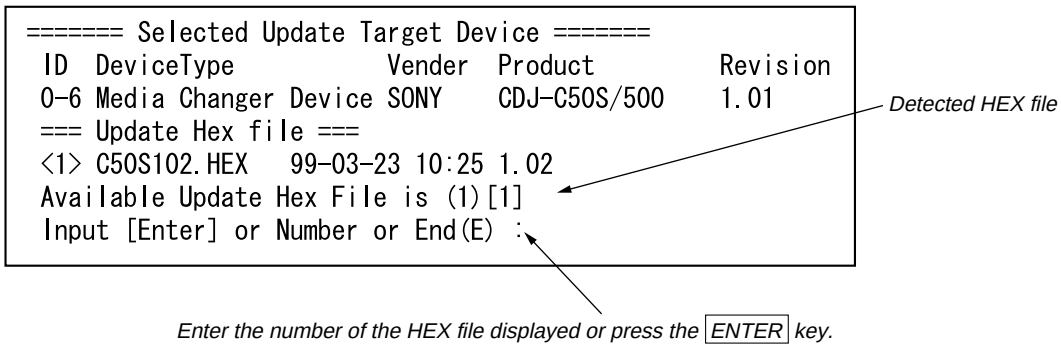
4. Enter "UPDATEF" and press the ENTER key. The following screen appears.
   If CDJ-500 is detected, the number corresponded to SCSI adress is displayed. Press the ENTER key to update program for this changer.
   (It is not necessary to enter number.)

```
======= Update Target Device =======
  No   ID  DeviceType             Vender  Product         Revision
 < 1>  0-0 < Not found >
 < 2>  0-1 < Not found >
 < 3>  0-2 < Not found >
 < 4>  0-3 CD-ROM Device          SONY    CD-ROM CDU625   1.0y
 < 5>  0-4 < Not found >
 < 6>  0-5 < Not found >
 < 7>  0-6 Media Changer Device   SONY    CDJ-C50S/500    1.01
 < 8>  1-0 < Not found >
 < 9>  1-1 < Not found >
 <10>  1-2 < Not found >
 <11>  1-3 < Not found >
 <12>  1-4 < Not found >
 <13>  1-5 < Not found >
 <14>  1-6 < Not found >
 Available Media Changer Number is [7].
 Input [Enter] or Number or End(E) :
```

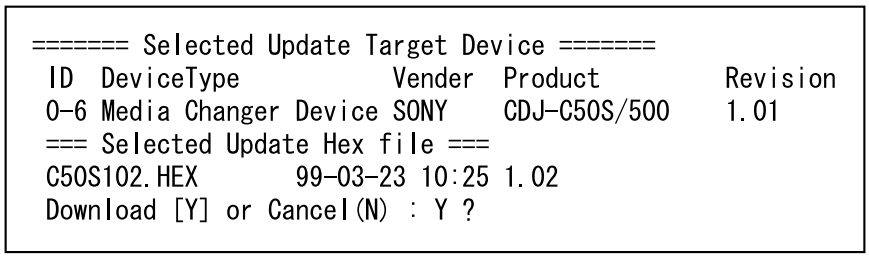
Enter the number of the changer displayed or press the ENTER key.

The changer detected and corresponding number are displayed.

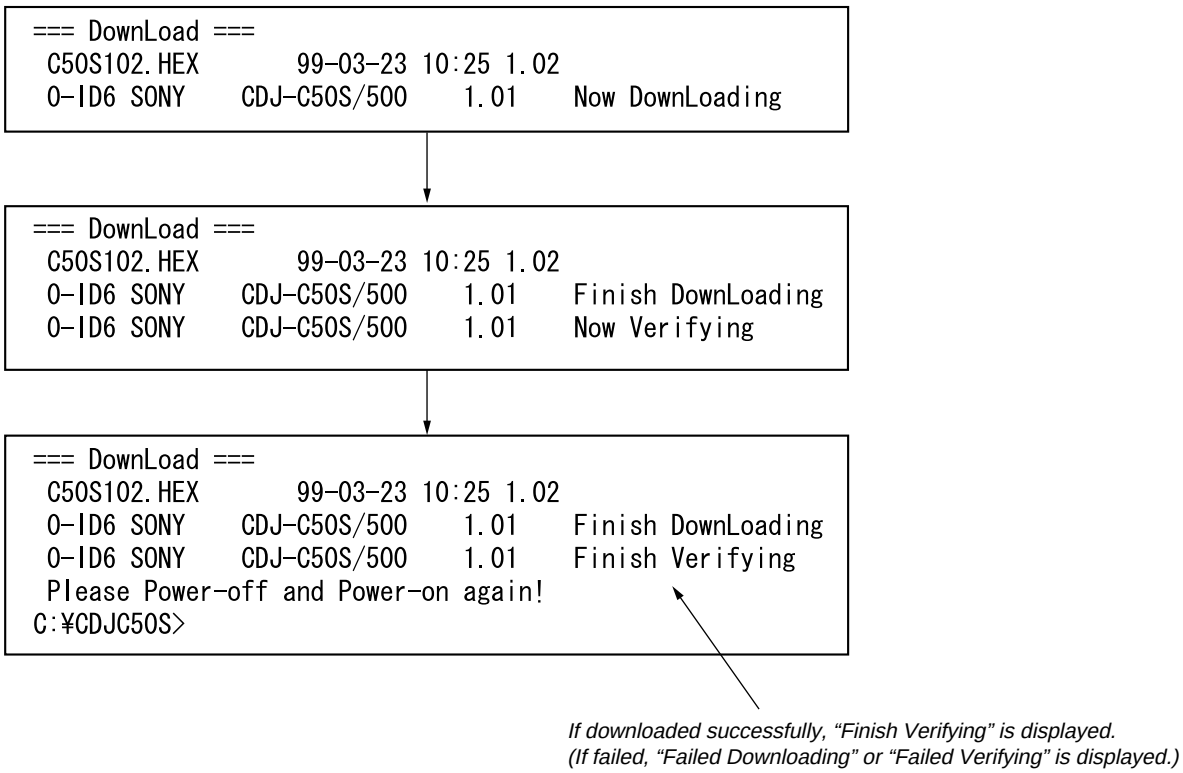
5. The program searches for the HEX file for the changer stored in the directory and displays the lists. To download the latest HEX file, only press the ENTER key. (It is necessary enter number, to downlord another HEX file.)


======= Selected Update Target Device =======
ID DeviceType Vender Product Revision
0-6 Media Changer Device SONY CDJ-C50S/500 1.01
=== Update Hex file ===
<1> C50S102.HEX 99-03-23 10:25 1.02
Available Update Hex File is (1)[1]
Input [Enter] or Number or End(E) :
Detected HEX file
Enter the number of the HEX file displayed or press the ENTER key.

6. As the HEX file selected is displayed, press the ENTER key. ("Y" is entered as the default)


======= Selected Update Target Device =======
ID DeviceType Vender Product Revision
0-6 Media Changer Device SONY CDJ-C50S/500 1.01
=== Selected Update Hex file ===
C50S102.HEX 99-03-23 10:25 1.02
Download [Y] or Cancel(N) : Y ?

7. Revision 1.01 is rewritten to 1.02 and the display switches as follows. The product information is still displayd old revision.


=== DownLoad ===
C50S102.HEX 99-03-23 10:25 1.02
0-ID6 SONY CDJ-C50S/500 1.01 Now DownLoading
=== DownLoad ===
C50S102.HEX 99-03-23 10:25 1.02
0-ID6 SONY CDJ-C50S/500 1.01 Finish DownLoading
0-ID6 SONY CDJ-C50S/500 1.01 Now Verifying
=== DownLoad ===
C50S102.HEX 99-03-23 10:25 1.02
0-ID6 SONY CDJ-C50S/500 1.01 Finish DownLoading
0-ID6 SONY CDJ-C50S/500 1.01 Finish Verifying
Please Power-off and Power-on again!
C:¥CDJC50S>
If downloaded successfully, "Finish Verifying" is displayed.
(If failed, "Failed Downloading" or "Failed Verifying" is displayed.)

8. The CHANGER indicator light up when download completes successfully. To restart the updated proglam, press the ⏻ button to turn OFF the power, and press it again to turn ON the power again."
9. Enter "UPDATEF" and press the ENTER key. The following is displayed on the screen.
10. Check the Revision here. Check that the Revision has been re-written to that downloaded, enter "E", and press the ENTER key to end the program."

```
======= Update Target Device =======
  No   ID  DeviceType              Vender  Product          Revision
 < 1>  0-0 < Not found >
 < 2>  0-1 < Not found >
 < 3>  0-2 < Not found >
 < 4>  0-3 CD-ROM Device           SONY    CD-ROM CDU625    1.0y
 < 5>  0-4 < Not found >
 < 6>  0-5 < Not found >
 < 7>  0-6 Media Changer Device    SONY    CDJ-C50S/500     1.02
 < 8>  1-0 < Not found >
 < 9>  1-1 < Not found >
 <10>  1-2 < Not found >
 <11>  1-3 < Not found >
 <12>  1-4 < Not found >
 <13>  1-5 < Not found >
 <14>  1-6 < Not found >
 Available Media Changer Number is [7].
 Input [Enter] or Number or End(E) :
```

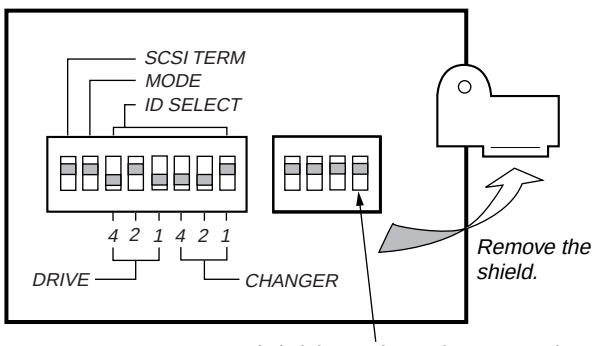
Check that the Revision is the downloaded revision.

Recovering when writing failed:

• If this unit does not operate normally after writing, perform writing again using the following procedure.

1. Remove the shield with the power OFF, set the "RECOVERY" DIP switch to OFF, press the ⏻ button and turn ON the power.
2. Execute the "UPDATEF" and perform the writing process again using the method described earlier.
3. After writing, turn OFF the power of the unit once.
4. Set the "RECOVERY" DIP switch to ON, and press the ⏻ button to turn ON the power.
5. Execute the "UPDATEF" using item 10 of the procedure described earlier.

Check that "Revision" has been updated.



RECOVERY DIP switch (Figure shows the ON state)

DOWNLOADING THE DRIVE PROGRAM USING THE DWN-ASPI.EXE PROGRAM

• Execute this program to rewrite the program of the drive of this unit.

Preparations:

• IBM PC compatible personal computer and display:
Use a personal computer with an HDD
• OS:
MS-DOS or PC-DOS version 5.0 or later.
Windows 95 or Windows 98 (When using Windows, follow the settings on Windows described later.)
• Floppy disk with the “DWN-ASP1.EXE” and “625_XXX.HEX” software
(CDM-002:J-2501-176-A)
• Floppy disk with latest drive program (625_XXX.HEX) (Supplied as necessary)
• SCSI board:
Use “Adaptec AVA-2904E” provided with this unit.
If not available, use an equivalent.
• ASPI manager setting:
For details, refer to “Installing ASPI manager” on page 5.
• SCSI cable:

Connection:

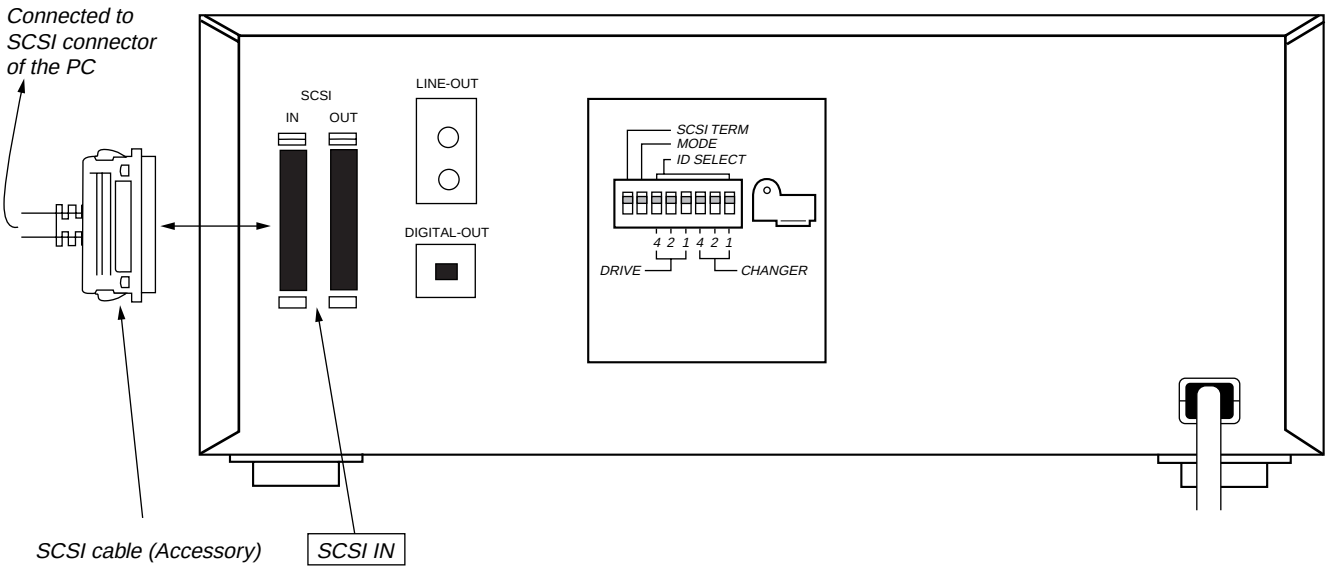
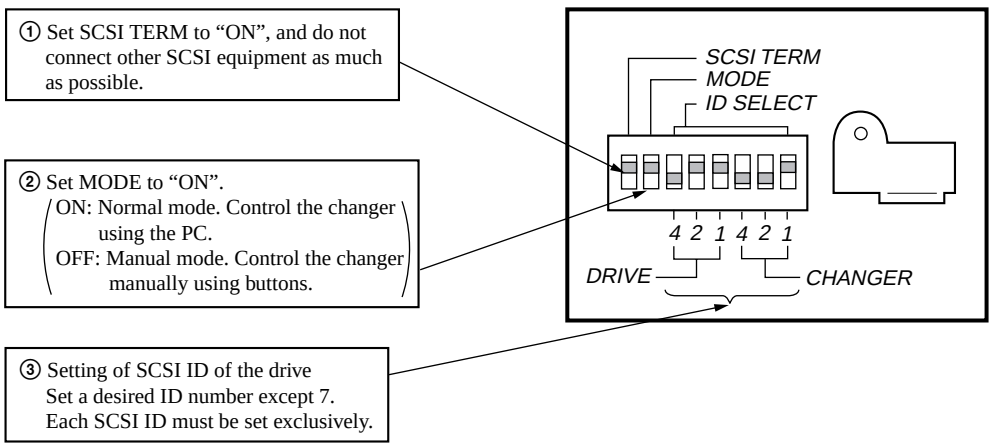


Fig. Connection of equipment

Setting:

• DIP switch settings

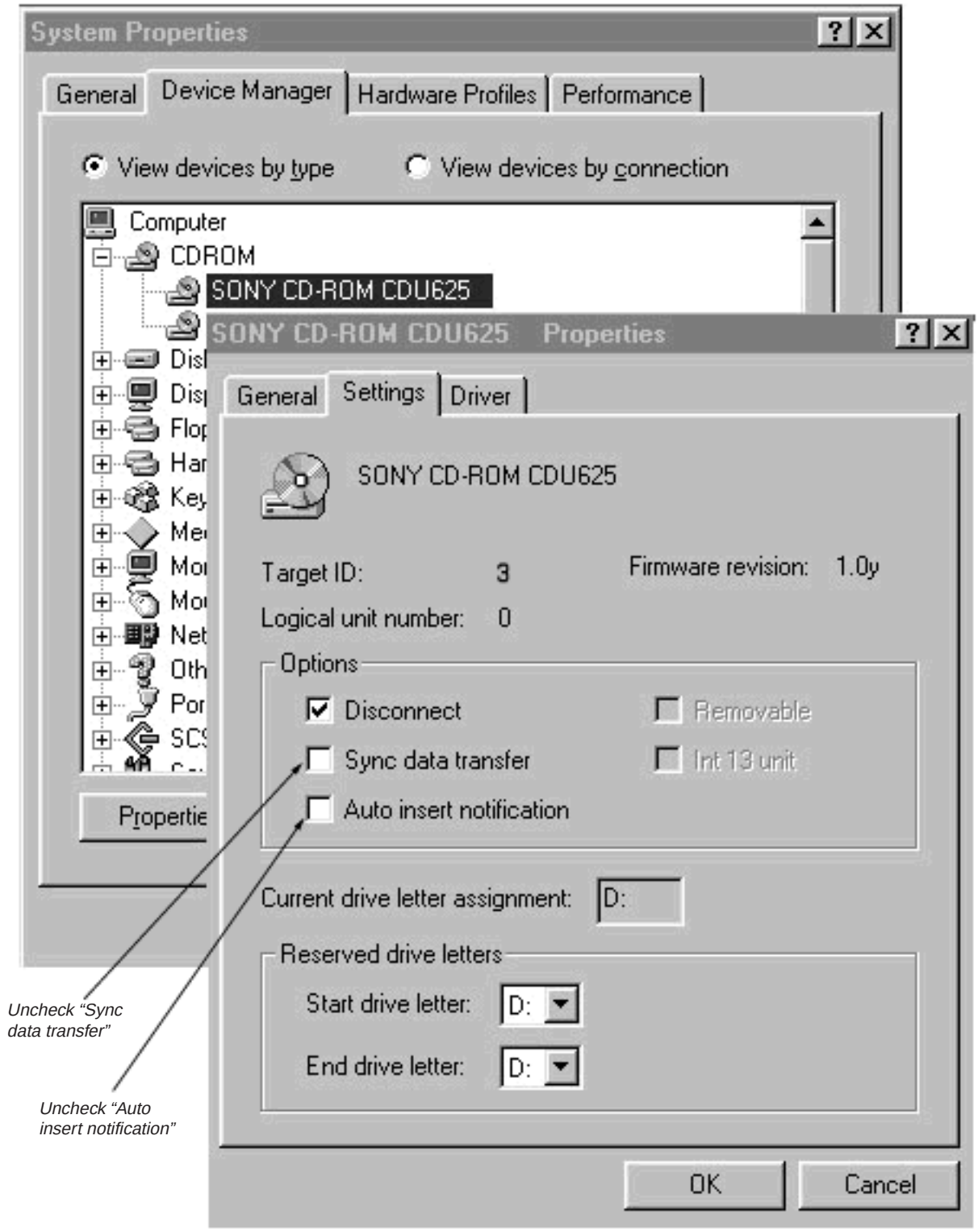

① Set SCSI TERM to “ON”, and do not connect other SCSI equipment as much as possible.
② Set MODE to “ON”.
ON: Normal mode. Control the changer using the PC.
OFF: Manual mode. Control the changer manually using buttons.
③ Setting of SCSI ID of the drive
Set a desired ID number except 7.
Each SCSI ID must be set exclusively.
SCSI TERM
MODE
ID SELECT
4 2 1 4 2 1
DRIVE
CHANGER

Settings on WINDOWS:

- To run this program in Windows, it must be set using the following procedure before hand.

1. Select “SYSTEM” on the “CONTROL PANEL” on Windows.

2. Display the “CD-ROM” device from “DEVICE MANAGER”, and select “SONY CD-ROM CDU625”.
   (See following diagram.)



3. Uncheck “Sync data transfer” and “Auto insert notification” at this screen.
4. Restart and the changes made will be set.

Operations:

1. Create a desired directory in the C drive of the PC used, and copy the DWN-ASPI.EXE file, and HEX file provided (e.g. 625_XXX.HEX).
   (The following assumes that the "CDJC50S" directory is created.)
2. The downloaded program can be executed on Windows 95/98. The following describes the state where the DOS prompt is executed from Windows 98. The following screen appears.

```
Microsoft(R) Windows 98
   (C)Copyright Microsoft Corp 1981-1998.

C:\WINDOWS>
```

3. Set the directory copied with the program at item 1. Enter "CD\CDJC50S" and press the ENTER key.

```
C:\WINDOWS>CD  \CDJC50S

C:\CDJC50S>
```

4. Enter "DWN-ASPI" and press the ENTER key. The following screen appears.
   (The following explains the example of rewriting the program 1.0W of the drive with 1.0Y.)

```
Firmware DownLoad VIA ASPI  Alpha-5   ---Sony CD-ROM---    [I.K. Aug  19, 1996]

Usage:Dwn-ASPI [Drive:¥Path¥]FileName[.HEX] [ID]


 Volume in drive C has no label
 Volume Serial Number is 0DDA-243B
 Directory of C:¥CDJC50S¥FIRM

625_S10Y.HEX    C50S101.HEX
       2 file(s)        315,056 bytes
       0 dir(s)       2,561.13 MB free









Hit any key to abort.
```

The HEX file in the directory executing the program is displayed.

5. Check that the HEX file copied in item 1 is present in the HEX file displayed.
6. Press any key and end the program.
7. Enter the HEX file name checked at step 6 as “DWN-ASPI 625_XXX” and press the ENTER key.

```
C:\CDJC50S>DWN-ASPI 625_S10Y
```

File name copied at item 1.

8. The following screen appears. Check that the HEX file is correct and enter “Y”.

```
Firmware DownLoad VIA ASPI  Alpha-5   ---Sony CD-ROM---    [I.K. Aug  19, 1996]
[ID:7]=ASPI for Windowsaic78xxaic78xx
Size of OBJ. [625_S10Y.HEX] => 049152 Bytes.  Accept? (Y/N) ==> ?
```

9. The following screen appears. If the ID is correct, enter “Y”. (When “N” is entered, the CD-ROM drive of another ID will be detected.)

```
Firmware DownLoad VIA ASPI  Alpha-5   ---Sony CD-ROM---    [I.K. Aug  19, 1996]
[ID:7]=ASPI for Windowsaic78xxaic78xx
Size of OBJ. [625_S10Y.HEX] => 049152 Bytes.

[ID:3]=SONY    CD-ROM CDU625   1.0w     [Available ROM Size:064 KBytes]
                                         Accept? (Y/N) ==> ?
```

The version of the program currently set.

10. The following screen appears. Press the ENTER key.

```
Firmware DownLoad VIA ASPI  Alpha-5   ---Sony CD-ROM---    [I.K. Aug  19, 1996]
[ID:7]=ASPI for Windowsaic78xxaic78xx
Size of OBJ. [625_S10Y.HEX] => 049152 Bytes.

[ID:3]=SONY    CD-ROM CDU625   1.0w     [Available ROM Size:064 KBytes]









                                        [Enter:DownLoad]    [Esc:Abort]
```

11. The following screen appears and files are downloaded one by one.

```
Firmware DownLoad VIA ASPI  Alpha-5   ---Sony CD-ROM---    [I.K. Aug  19, 1996]
[ID:7]=ASPI for Windowsaic78xxaic78xx
Size of OBJ. [625_S10Y.HEX] => 049152 Bytes.

[ID:3]=SONY    CD-ROM CDU625   1.0w     [Available ROM Size:064 KBytes]

[ID:3] Downloading INQUIRY data.                        Complete.
[ID:3] Downloading & writing ROM data [00000~03FFF]    Complete.
[ID:3] Downloading & writing ROM data [04000~07FFF]    Wait for a moment...
```

12. When downloading is finished, the following screen appears.

```
Firmware DownLoad VIA ASPI  Alpha-5   ---Sony CD-ROM---    [I.K. Aug  19, 1996]
[ID:7]=ASPI for Windowsaic78xxaic78xx
Size of OBJ. [625_S10Y.HEX] => 049152 Bytes.

[ID:3]=SONY    CD-ROM CDU625   1.0w     [ID:3]=SONY    CD-ROM CDU625   1.0y

[ID:3] Downloading INQUIRY data.                          Complete.
[ID:3] Downloading & writing ROM data [00000~03FFF]    Complete.
[ID:3] Downloading & writing ROM data [04000~07FFF]    Complete.
[ID:3] Downloading & writing ROM data [08000~0BFFF]    Complete.
[ID:3] Downloading & writing ROM data [0C000~0FFFF]    Complete.
[ID:3] Self resetting..                                   Complete.
[ID:3] Verifying ROM data [00000~03FFF]                   Complete.
[ID:3] Verifying ROM data [04000~07FFF]                   Complete.
[ID:3] Verifying ROM data [08000~0BFFF]                   Complete.
[ID:3] Verifying ROM data [0C000~0FFFF]                   Complete.









 Hit any key to continue, or Esc to abort.
```

Newly rewritten program version

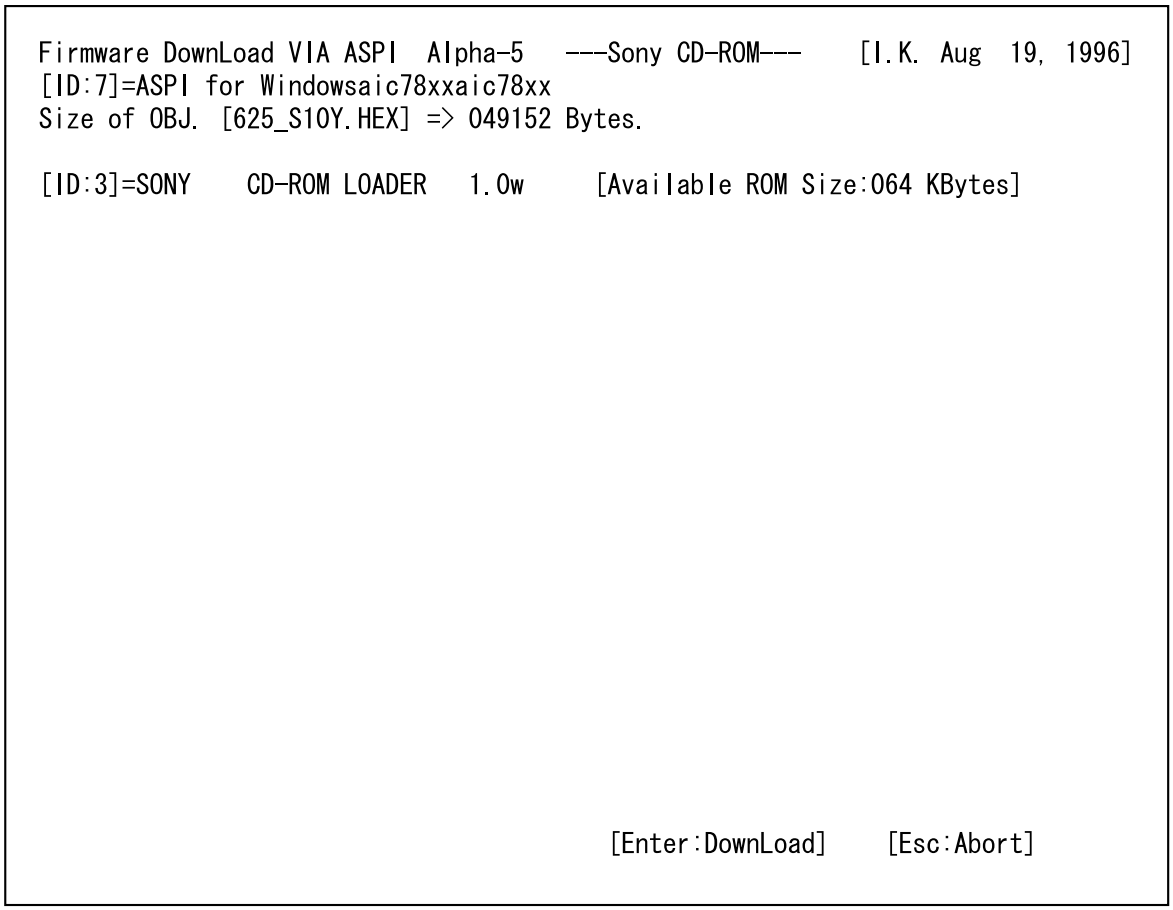
13. When “Complete” is displayed at all items, it means that downloading”. If “Failure” or “Verify Error!” is displayed, correct the cause and repeat the procedure again.

Note:

If downloading failed halfway through, the CD-ROM device name changes to CD ROM LOADER. Check system environment especially SCSI configration.

To download another time, select this device.

(The screen shows the following for step 10.)

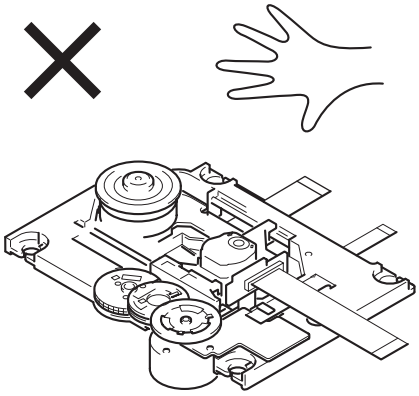

Firmware DownLoad VIA ASPI Alpha-5 ---Sony CD-ROM--- [I.K. Aug 19, 1996]
[ID:7]=ASPI for Windowsaic78xxaic78xx
Size of OBJ. [625_S10Y.HEX] => 049152 Bytes.
[ID:3]=SONY CD-ROM LOADER 1.0w [Available ROM Size:064 KBytes]
[Enter:DownLoad] [Esc:Abort]

14. To end, press the ESC key.
15. The POWER indicator and CHANGER indicator of the unit light up. To set the changes, press the ⏻ button to turn OFF the power, and press it again to turn ON the power again.”

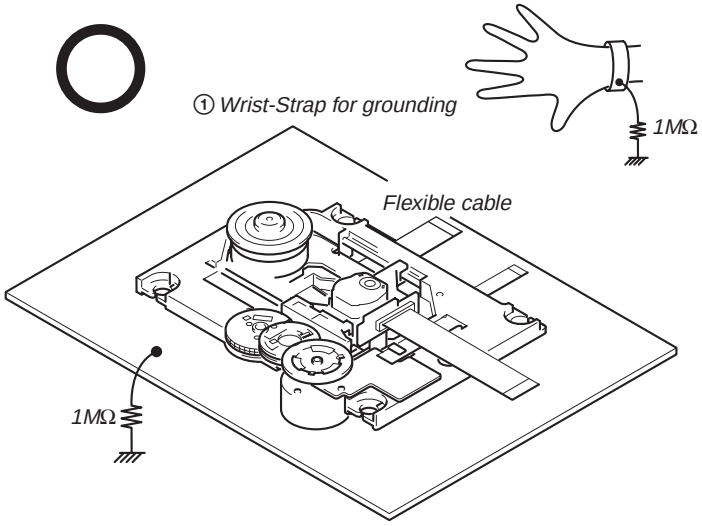
Note: Note on repairring the Base Unit assy.

When opening or repairing the unit, grounding is required to prevent damage caused by static electricity and is as follows:

1. Grounding for the human body
   Be sure to wear a wrist-strap for grounding (with impedance lower than $10^8\Omega$) whose other end is ground. The strap works to drain away the static electricity build-up on the human body.
2. Grounding for the work table
   Be sure to lay a conductive sheet (with impedance lower than $10^9\Omega$) on the table, such as a sheet of copper, which is ground.
3. As static electricity built-up on clothes does not drain away, be careful not to let your clothes touch the unit.

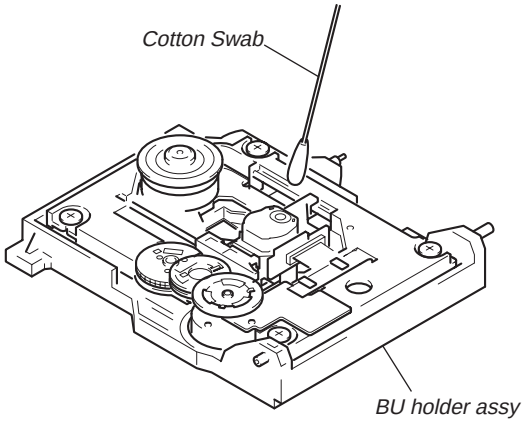


Base unit assy



② Conductive sheet or copper plate

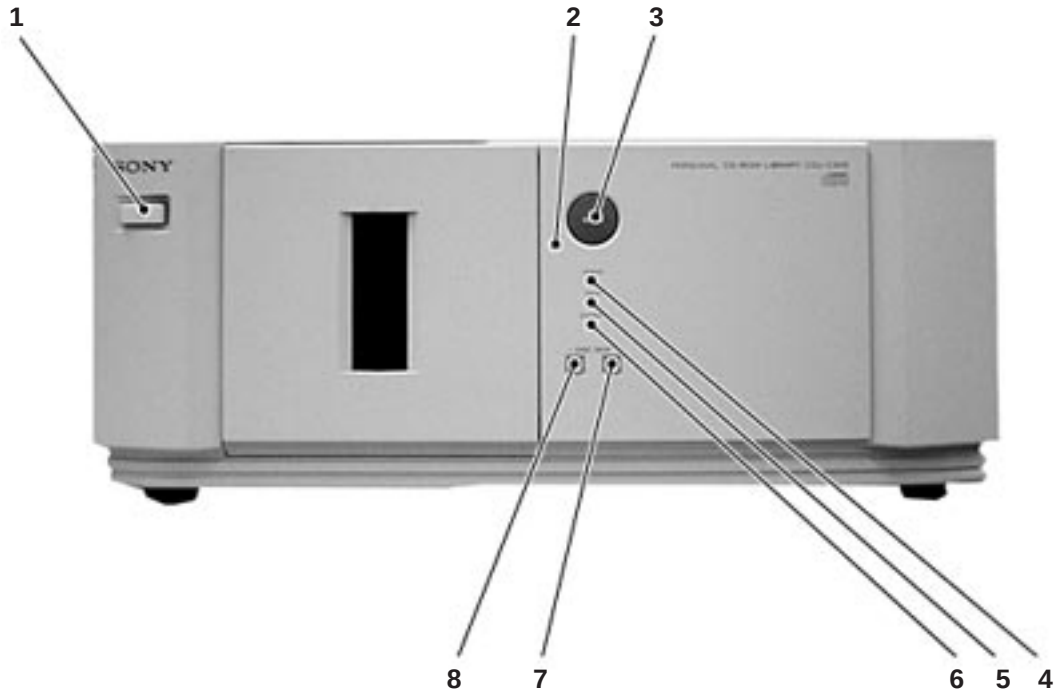
4. Do not apply excessive force to the lens when wiping. Optical device is structured by very sensitive mechanical parts. The lens holding mechanism may have damage if excessive force is applied.



SECTION 2
GENERAL

LOCATION OF PARTS AND CONTROLS

Front Panel

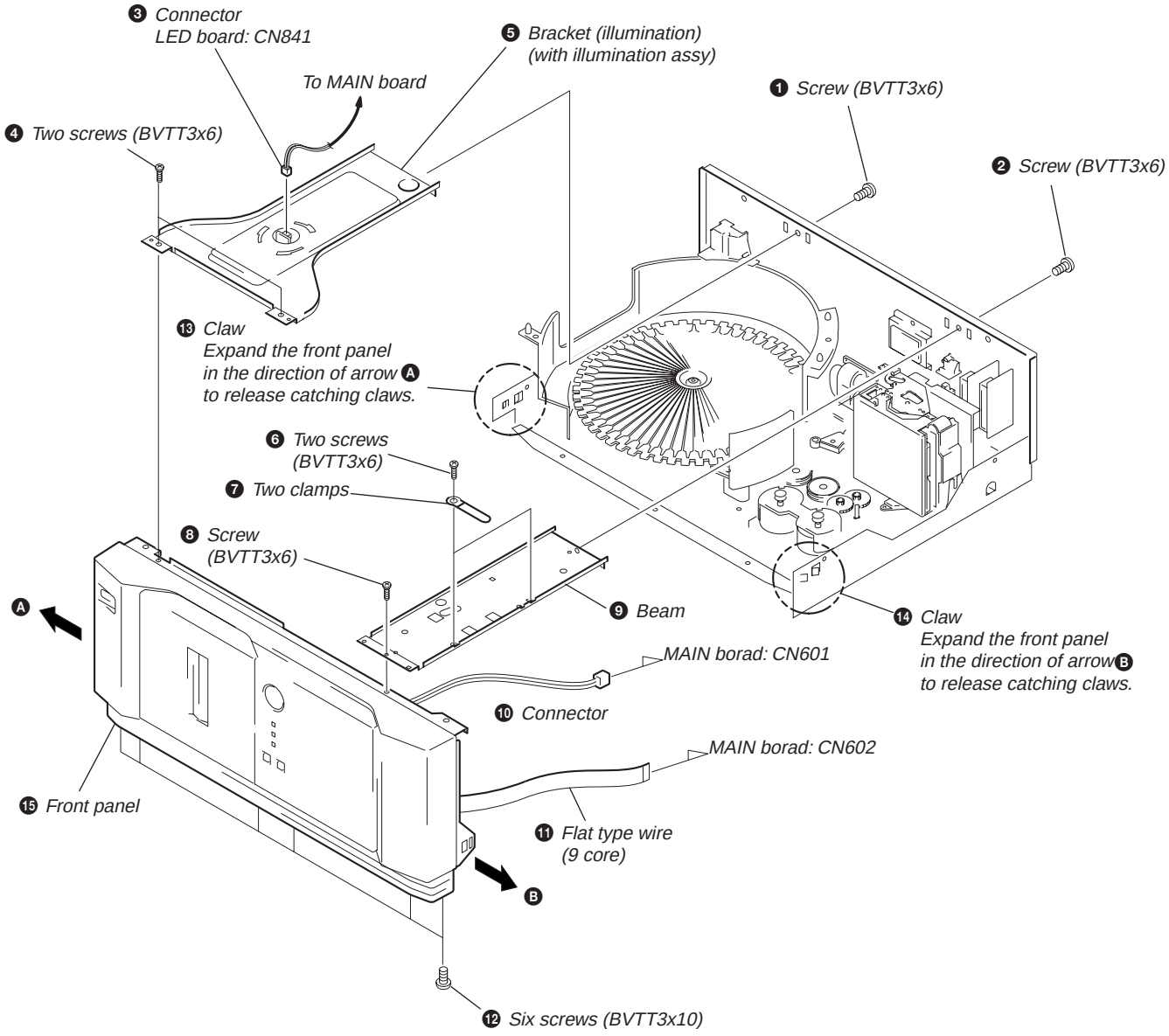


1 ⏻ button
2 Emergency eject hole
3 OPEN button
4 POWER indicator
5 DRIVE indicator
6 CHANGER indicator
7 DISC SKIP + button
8 DISC SKIP – button

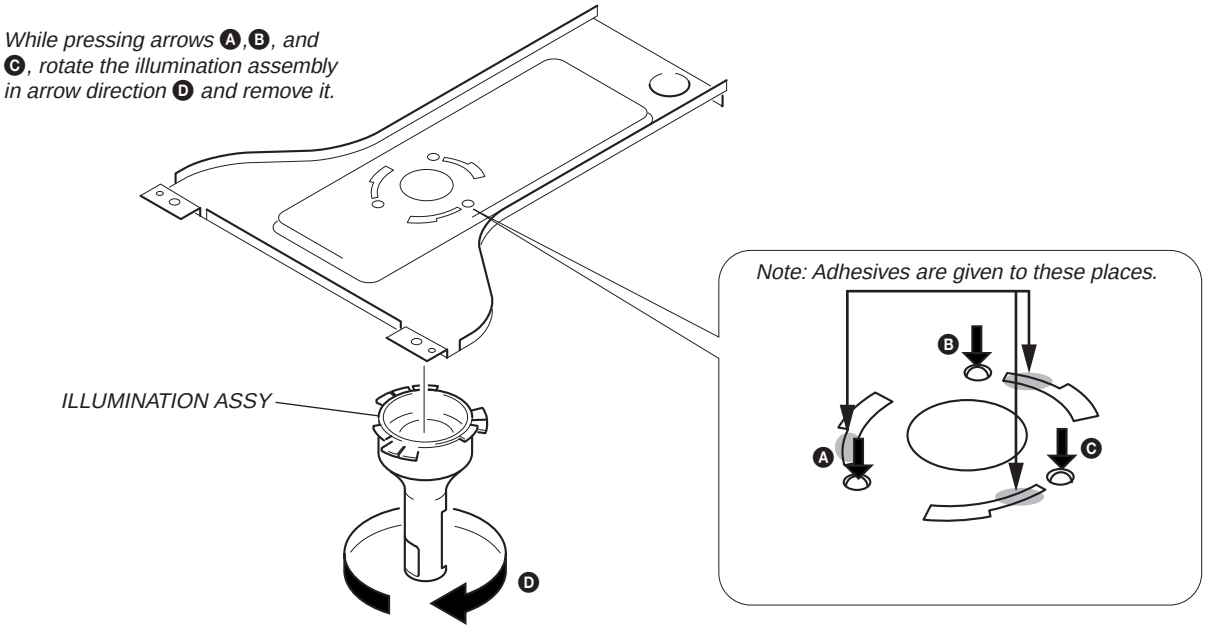
SECTION 3
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

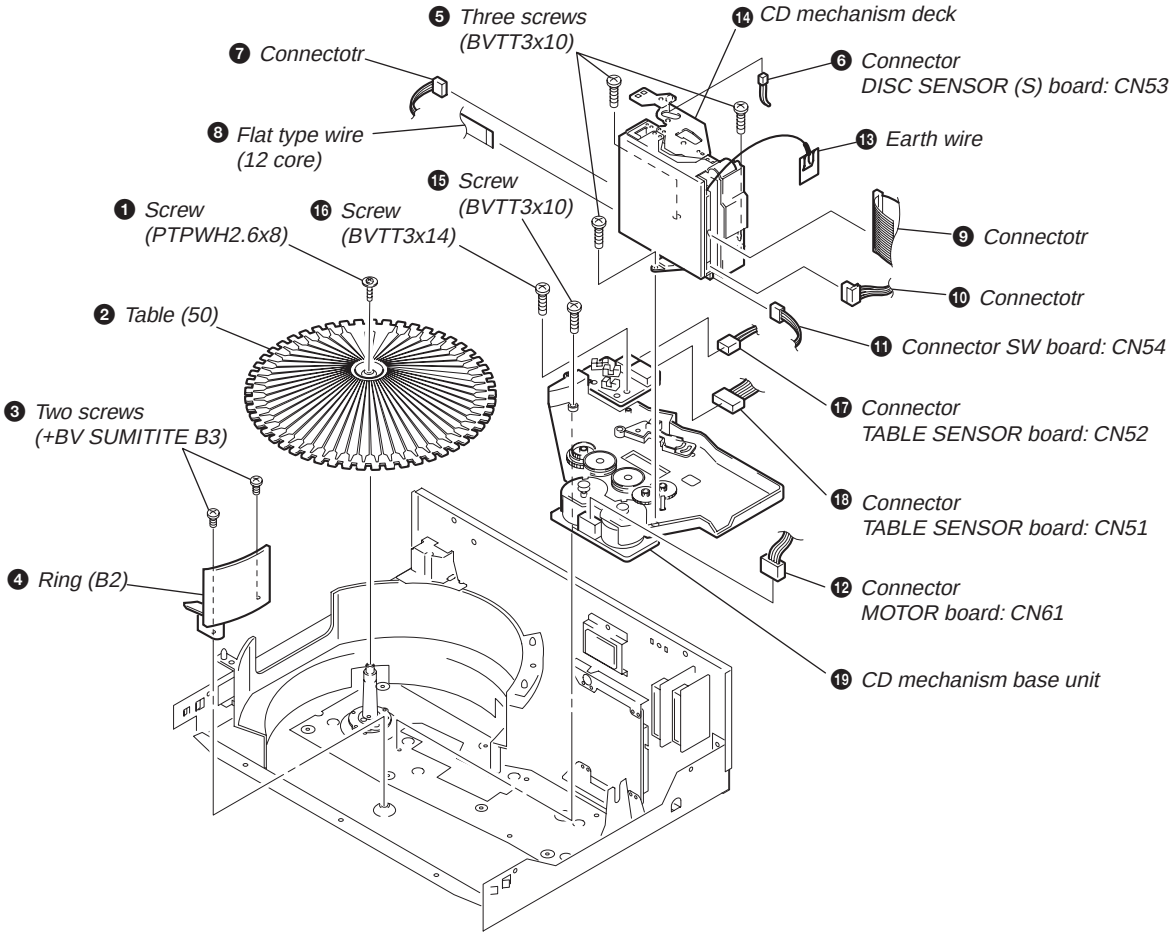
3-1. FRONT PANEL



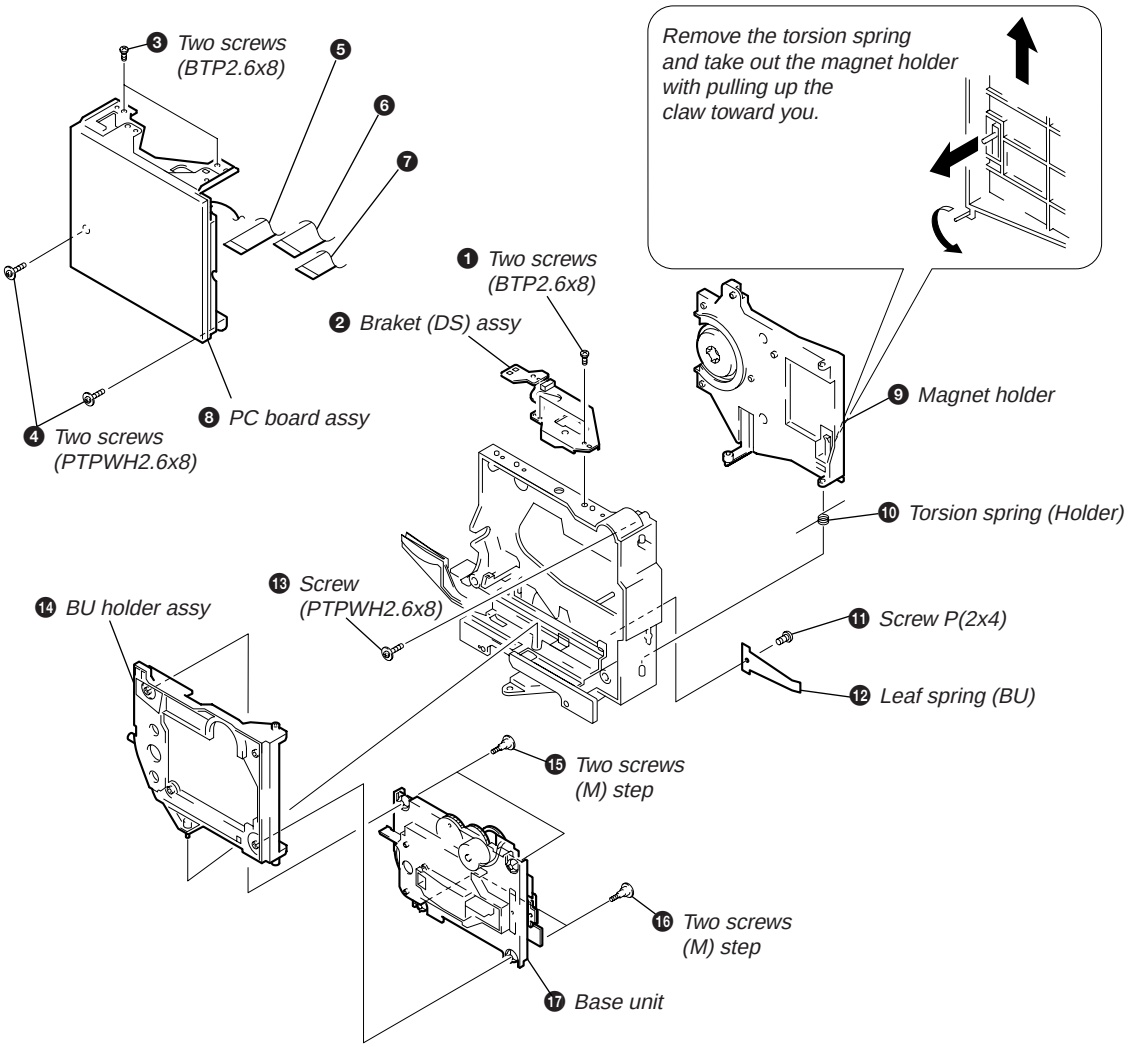
3-2. ILLUMINATION ASSY


While pressing arrows A,B, and C, rotate the illumination assembly in arrow direction D and remove it.
ILLUMINATION ASSY
D
Note: Adhesives are given to these places.
A
B
C

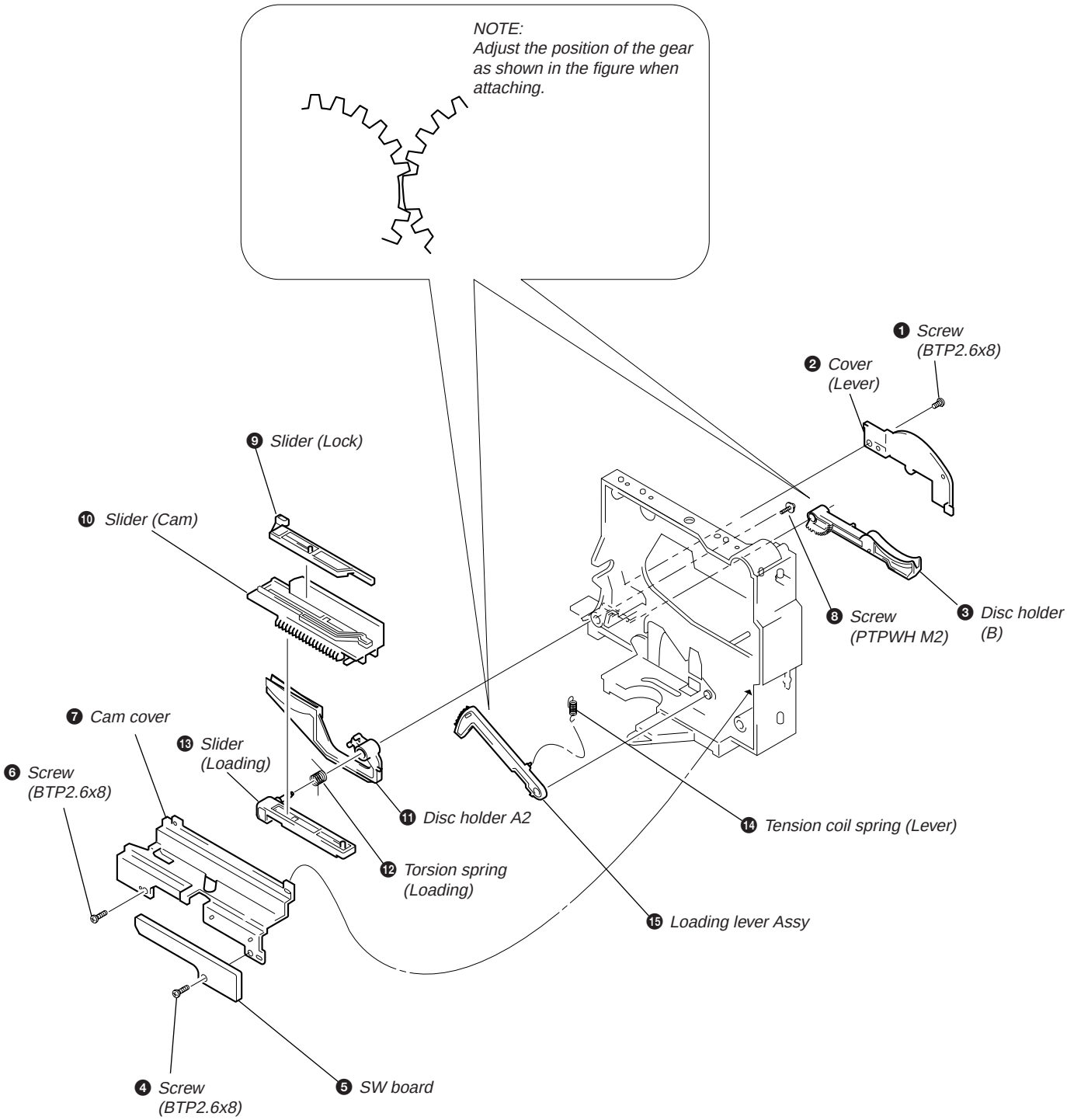
3-3. CD MECHANISM DECK


5 Three screws (BVTT3x10)
14 CD mechanism deck
7 Connectotr
6 Connector DISC SENSOR (S) board: CN53
8 Flat type wire (12 core)
13 Earth wire
15 Screw (BVTT3x10)
1 Screw (PTPWH2.6x8)
16 Screw (BVTT3x14)
9 Connectotr
10 Connectotr
2 Table (50)
11 Connector SW board: CN54
3 Two screws (+BV SUMITITE B3)
17 Connector TABLE SENSOR board: CN52
18 Connector TABLE SENSOR board: CN51
4 Ring (B2)
12 Connector MOTOR board: CN61
19 CD mechanism base unit

3-4. BASE UNIT AND MAGNET HOLDER


Remove the torsion spring and take out the magnet holder with pulling up the claw toward you.
❸ Two screws (BTP2.6x8)
❺
❻
❼
❶ Two screws (BTP2.6x8)
❷ Braket (DS) assy
❽ PC board assy
❹ Two screws (PTPWH2.6x8)
❾ Magnet holder
❿ Torsion spring (Holder)
⓭ Screw (PTPWH2.6x8)
⓮ BU holder assy
⓫ Screw P(2x4)
⓬ Leaf spring (BU)
⓯ Two screws (M) step
⓰ Two screws (M) step
⓱ Base unit

3-5. CD MECHANISM SECTION

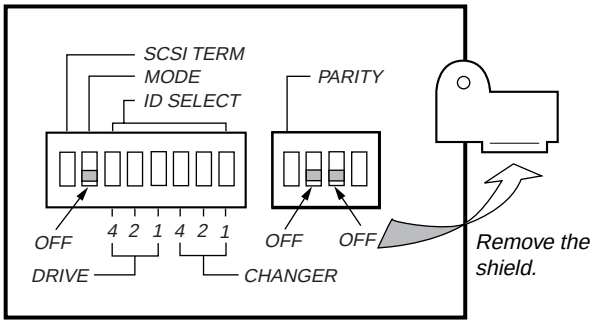


SECTION 4
MECHANICAL ADJUSTMENTS

4-1. DISC HOLDER A ADJUSTMENT/CHUCKING PULLEY POSITION ADJUSTMENT

Proceure:

1. Remove the plate shown in figure with the power OFF. (Fig.1)
2. Remove the shield, set the DIP switches on the back panel as shown below.



3. Press the ⏻ button to turn ON the power, and press the OPEN button to open the front door. Insert a disc in the "PLUS ONE" slit. Prease use a flat disc.

Note: If the "PLUS ONE" slit is not at the front, press the OPEN button and the "PLUS ONE" slit will come to the front automatically.

4. Close the front door. The disc table rotates and the disc is chucked.
5. Press the ⏻ button to turn OFF the power.
6. While pressing the OPEN button, DISC SKIP – button, and DISC SKIP + button simultaneously, press the ⏻ button to turn ON the power. (Keep on pressing three buttons untill CHANGER LED is flasing.)
7. Continue pressing the DISC SKIP + button until loading end.
8. Rotate the pulley with finger (Fig. 2) to stop the disc holder A2 slightly away from the disc (Fig. 3).
9. Check that disc holder A2 is not touching the disc, and adjust the adjusting screw A until the edge of the disc meets the edge of the disc holder as shown in the figure. (Fig. 4, Fig. 5)

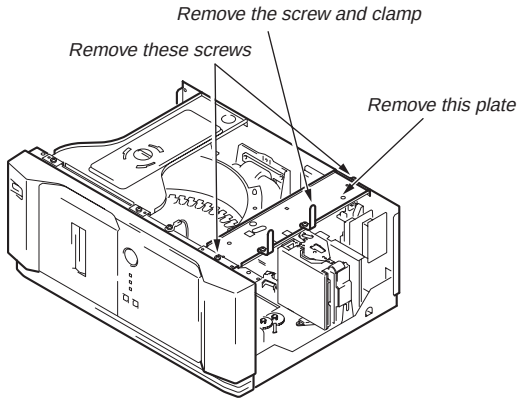


Fig. 1

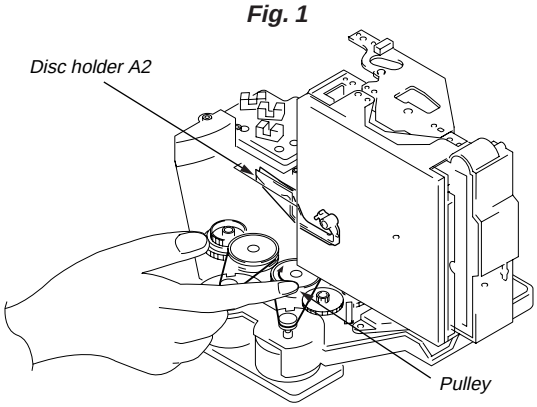


Fig. 2

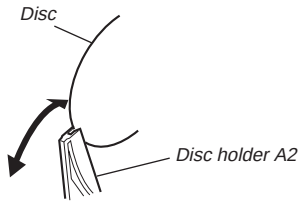


Fig. 3

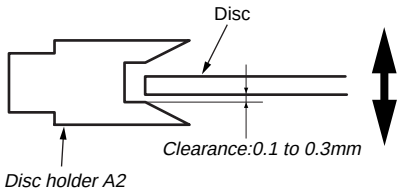


Fig. 4

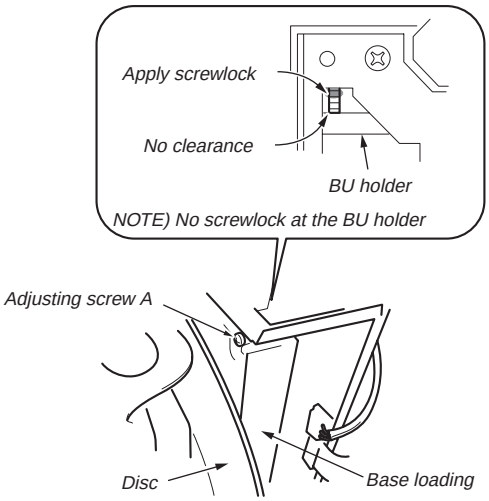


Fig. 5

10. After adjusting, apply screwlock.
11. Continue pressing the DISC SKIP – button. After loading out, continue pressing the DISC SKIP + button until loading in again.
12. Check that the disc is at the position adjusted to in step 7.
13. Continue pressing the DISC SKIP + button until loading end.
14. Visually check the chucking pulley, and adjust the adjusting screw B shown in the figure so that the positional relation of the holder (magnet) and chucking pulley satisfies the specified values. (Fig. 4, Fig. 5).

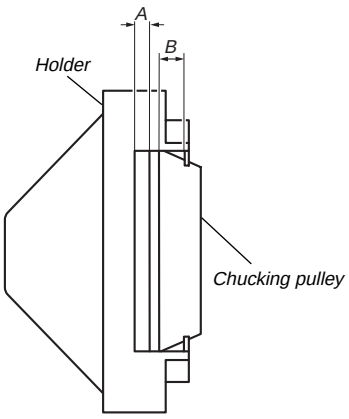


Fig. 6

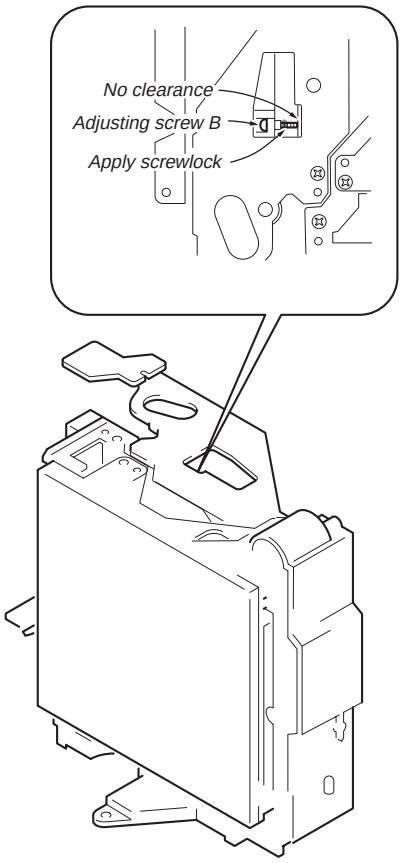
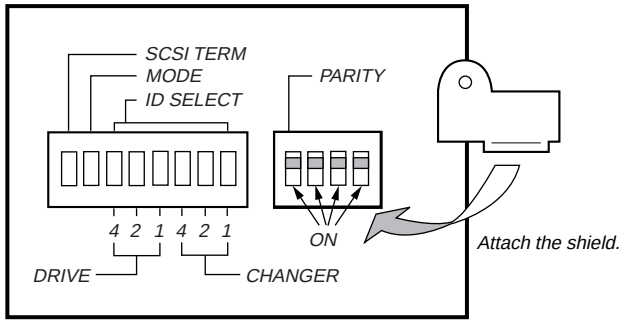


Fig. 7

Specified value: Clearance A = Clearance B

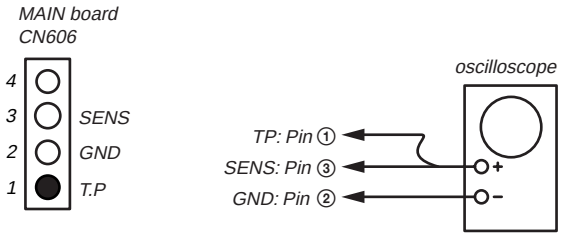
15. After adjusting, apply screwlock.
16. By pressing the DISC SKIP + and DISC SKIP - button, check the loading in and out operations can be performed properly.
17. Remove the disc and press the ⏻ button to turn OFF the power.
18. Set the DIP switch as below and attach the shield.



19. Attach the plate removed in step 1.

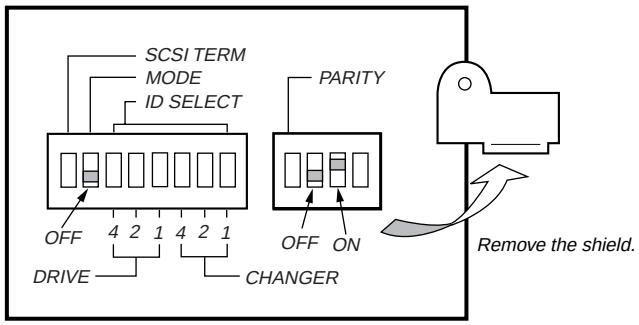
4-2. DISC SENSOR ADJUSTMENT

Connection: MAIN Board

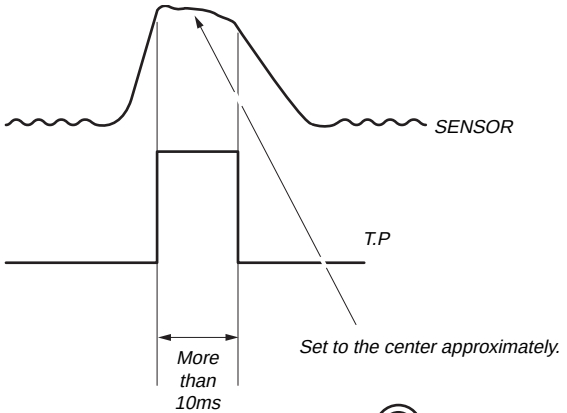


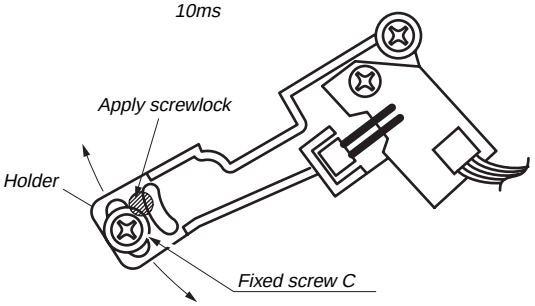
Note: Remove all discs before adjustment.
Procedure:

1. Connect the oscilloscope to CN606 of the MAIN board as shown in the connection diagram.
2. Remove the shield, set the DIP switches on the back panel as shown below.

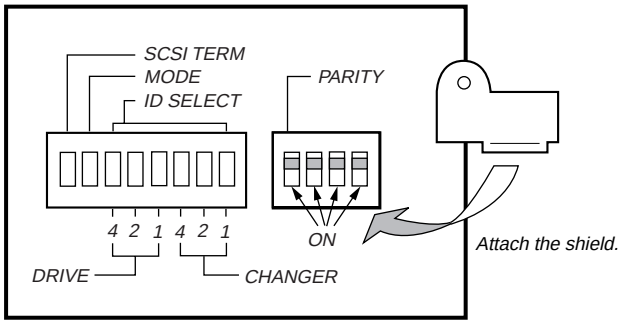


3. While pressing the OPEN button, DISC SKIP – button, and DISC SKIP + button simultaneously, press the ① button to turn ON the power. (Keep on pressing three buttons untill CHANGER LED is flashing.)
4. Press the DISC SKIP + . The disc table starts to rotate in the clockwise direction.
5. Loosen the fixed screw C to move the holder (sensor R) and secure it when the H portion of the T.P. waveform of the oscilloscope comes to the center of the H portion of the SENSOR waveform.





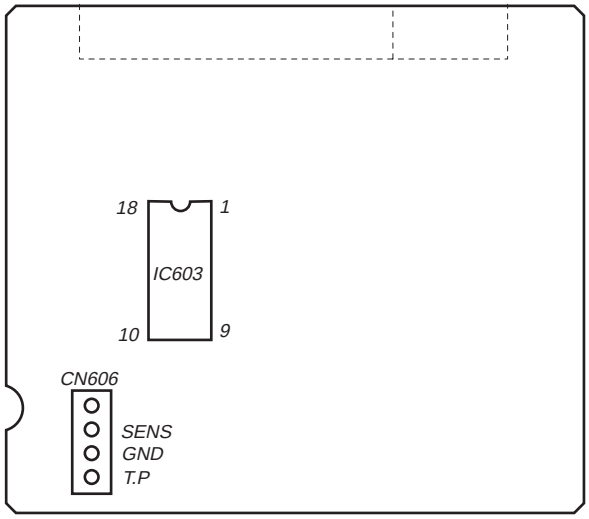
6. Press the DISC SKIP – button. The disc table starts to rotate in the counterclockwise direction.
7. Check that the waveform on the oscilloscope is the same as that adjusted in step 5. Repeat from step 4 if it is not.
8. Tighten the fixed screw C properly to secure the holder (sensor R). Check the adjustment in step 4 to 7.
9. Apply screwlock and press the ① button to turn OFF the power.
10. Remove the oscilloscope connected in step 1.
11. Set the DIP switch as below and attach the shield.



You can change the direction dinamically by pressing DISC SKIP+, DISC SKIP– button while adjustment mode.
You can stop rotation by pressing OPEN button.

Adjustment Location :

[MAIN BOARD] — Side B —



SECTION 5
ELECTRICAL ADJUSTMENTS

5-1. TOOLS AND MEASURING INSTRUMENTS

5-1-1. GENERAL AND SPECIAL TOOLS LIST

The tools and measuring instruments for performing maintenance on the CDM-56 series are listed below.

5-1-1-1. General Tools

	SONY Parts No.
⊕Driver 2mm	(7-700-749-01)
⊕Driver 2.6mm	(7-700-749-03)
Tweezers	(7-700-753-02)
Round Nose Plier	(7-700-757-01)
Cutter	(7-700-758-02)
Soldering Iron (20W)	
Desoldering Metal Braid (Solder Wick)	
Multi Meter (DRM)	

5-1-1-2. Special Tools

IBM PS/VP System
PS/VP and the monitor (640kbyte RAM, 3.5" FDD, HDD, Video RAM-CGA or Higher, DOS Ver. 6.2 or later)
SCSI board AVA-2904E that is supplied as an accessory of CDJ-500 or equivalent.
Active Speaker
SCSI cable (Attached or equal cable)

5-1-1-3. Test Disc

SONY Test Disc (YEDS-18)	(3-702-101-01)
SONY Test Disc (TGRS-21)	(J-2501-110-A)

5-1-1-4. Measuring Equipments

Osilloscope Dual Trace 20MHz (probe x10)
DC Volt Meter (min. 10mA)

5-1-1-5. Software

ATP625 Disc (CDM-001)	(J-2501-173-A)
Field50. EXE Disc (CDJ-001)	(J-2501-172-A) (*NOTE)
Dwn-Aspi. EXE (CDM-002)	(J-2501-176-A) (*NOTE)
Update f. EXE Disc (CDJ-002)	(J-2501-175-A) (*NOTE)

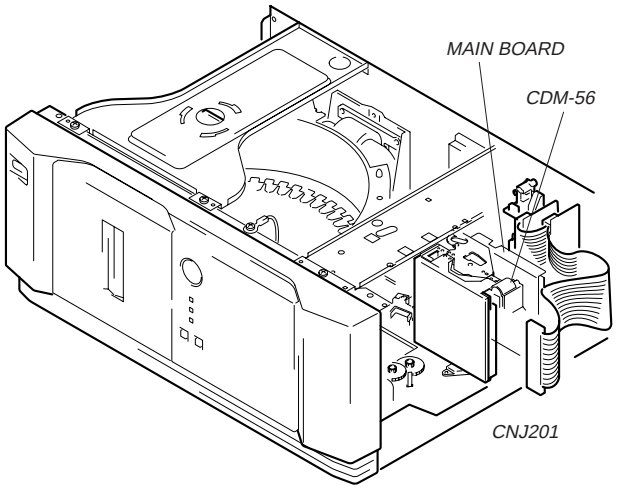
*: marked is refer to SERVICING NOTE

5-1-1-6. Expendable and Chemical Supplies

Cotton Swab (200 pieces)	(7-740-900-65)
Lens Cleaning Liquid	(J-2501-000-A)
Molykote Grease (EM-30L)	(4-918-645-01)
Hanarl (SFL-9)	(7-400-000-00)

5-1-2. Setting Single-Operation of CDM-56 Mechanism Block

Jig
CD test disc (YEDS-18) : 3-702-101-01



Single-Operation of CDM-56

1. Chuck the disc beforehand.
2. Set the COMMAND SW of the controller to the test mode.

ID2	ID1	ID0	PARITY
ON	OFF	ON	ON

3. While pressing the TEST button of the MAIN BOARD, turn on the power of the CDJ-C50S or power supply unit.
4. After about 1 second later, release the TEST button.
5. This sets the test mode. To enter the other mode, refer to the following table, set the dip switch, and press the TEST button.

Setting of Single-Operation Mode

Mode	ID2	ID1	ID0	PARITY
Test Mode	ON	OFF	ON	ON

Command list of Single-Operation Mode

Mode	ID2	ID1	ID0	PARITY
Initialize	ON	ON	ON	ON
x1 speed	ON	ON	OFF	ON
x4 speed	ON	OFF	ON	ON
x8 speed	ON	OFF	OFF	ON
x12 –x24(Partial CAV) speed	OFF	ON	ON	ON
Tracking servo OFF	ON	ON	OFF	OFF
Tracking servo ON	ON	ON	ON	OFF
PlayAudio (23'47")	OFF	OFF	ON	ON
PlayAudio (5'00")	OFF	ON	OFF	ON
PlayAudio (55'00")	OFF	OFF	OFF	ON

5-1-3. SYSTEM CONFIGURATION

5-1-3-1. Set up PS/VP System

a. Add the ANSI.SYS (Device = ANSI. SYS) and ASPI 8 DOS.SYS in Config. SYS.
   (Refer to Instruction Manual for more detail)
b. Set the jumpers on the Adaptec SCSI Interface board as follows. (Refer to Instruction Manual for Adaptec SCSI board AHA-1520B or 2940 in detail)

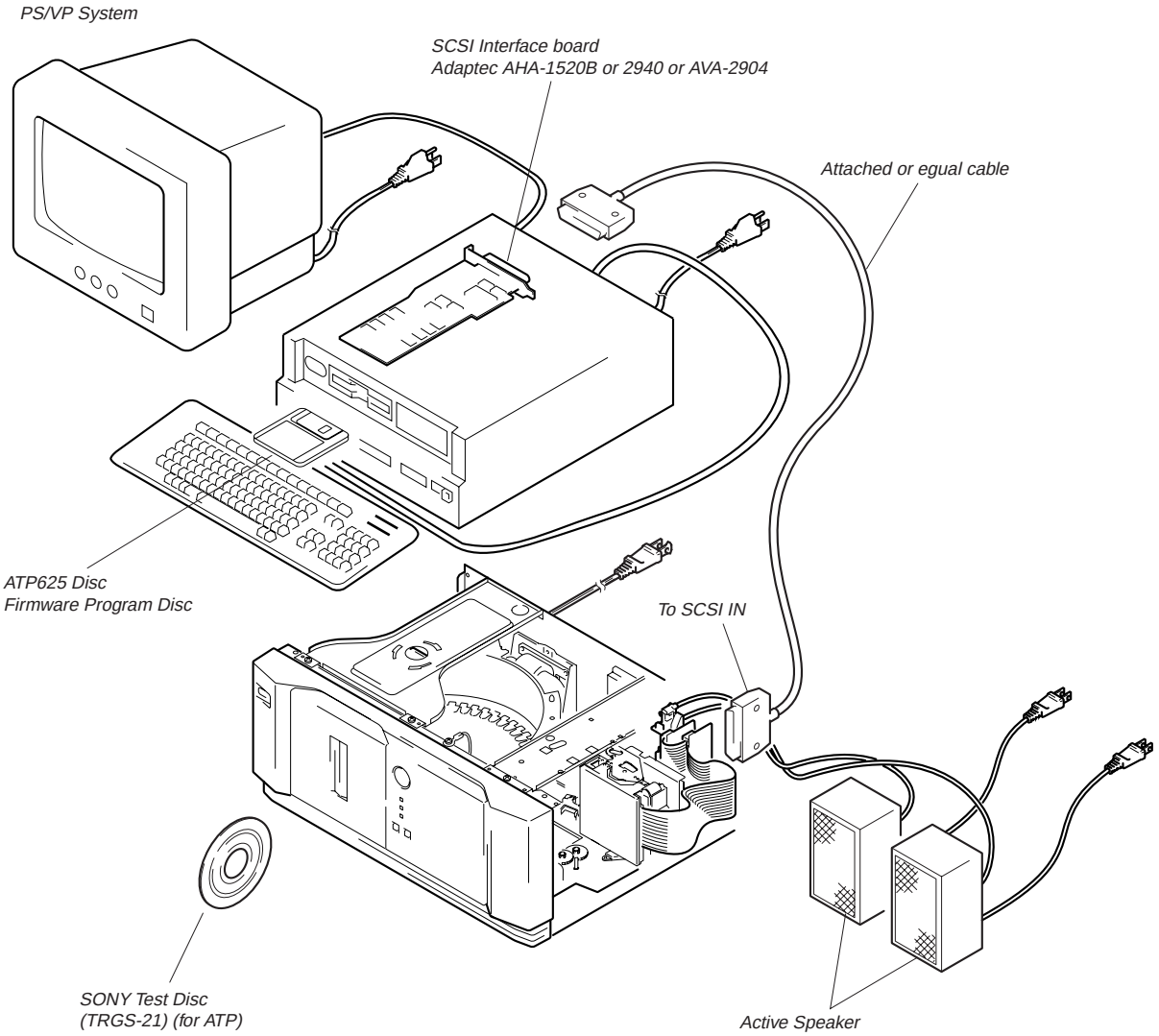
Setting of SW and Configuration file.

AHA-1520B (for ISA BUS)…
All of DIP SW (1 to 4) are OFF.…
AHA-2940 (for PCI BUS)…AVA-2904E (for PCI BUS)
No Jumper and SW setting on the board.
Use default parameter for SSI Select configuration utility.
It is not necessary to install the device driver when using on the windows ’95.
It is necessary to install the device driver at first line of config. sys when using on DOS.

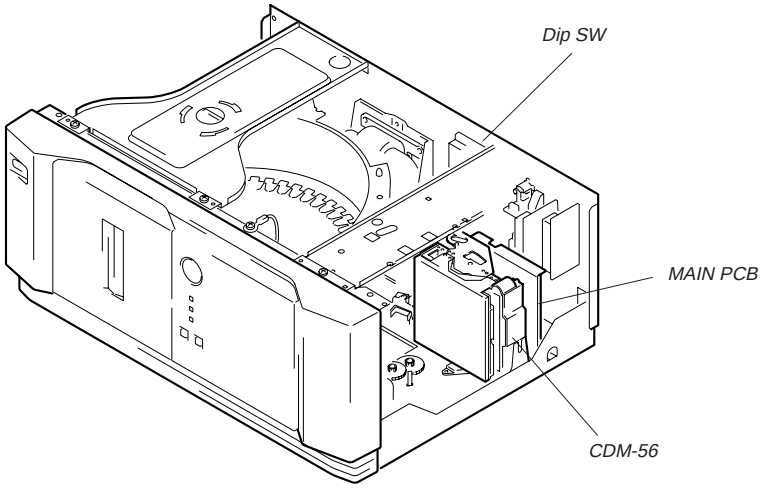
c. Install the SCSI Interface board in the PS/VP System.

5-1-3-2. System Configuration

Note: AVA-2904E is supplied as an accessory of the set.

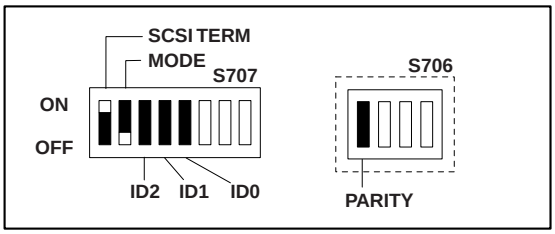


ATP/DOWNLOAD System

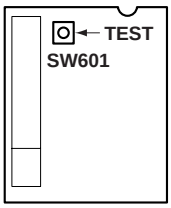


***Note:**
It is not needed to disconnect the internal SCSI cable.

SCSI TERM : ON
MODE : OFF



Dip SW



MAIN BOARD

Function check

5-2. TROUBLE SHOOTING

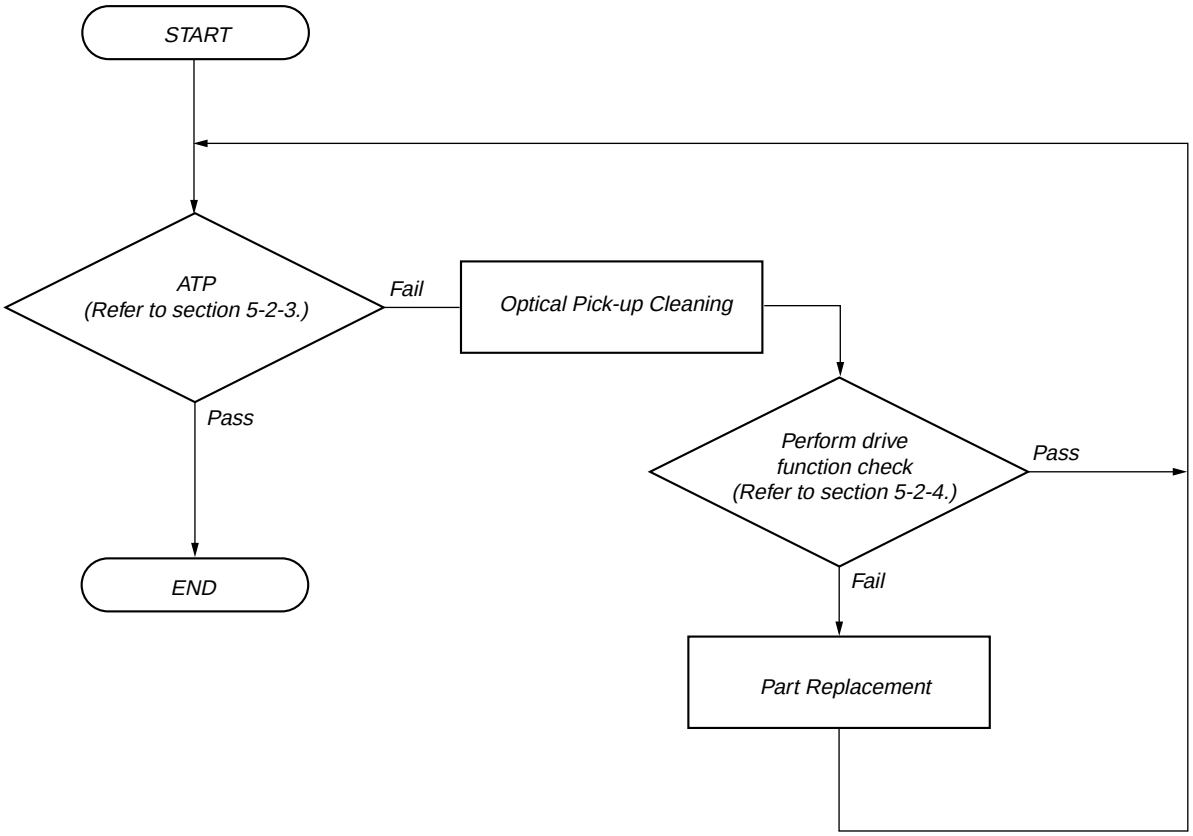
This section describes trouble shooting methods.
Section 4-2-2. shows the flowchart of the processing routine of the unit. Section 4-2-3. describes the ATP procedures. These sections define the detective parts under operating conditions.

5-2-1. BEFORE TROUBLE SHOOTING

The following procedures are recommended to verify if the drive is really faulty or not:

a. Poor connection with the host system
   (esp. GND-related connection, frame GND, etc.)
b. Incorrect operational procedure.
c. Program error of host system
d. The SCSI TERM of DIP SW on the rear of set is not set to ON.
e. Wrong Drive Number selection
f. Wrong supply voltage
g. Environmental conditions (where electrical noise easily jumps into signal)
h. Influence of strong magnetic field.

5-2-2. FLOWCHART FOR TROUBLE SHOOTING



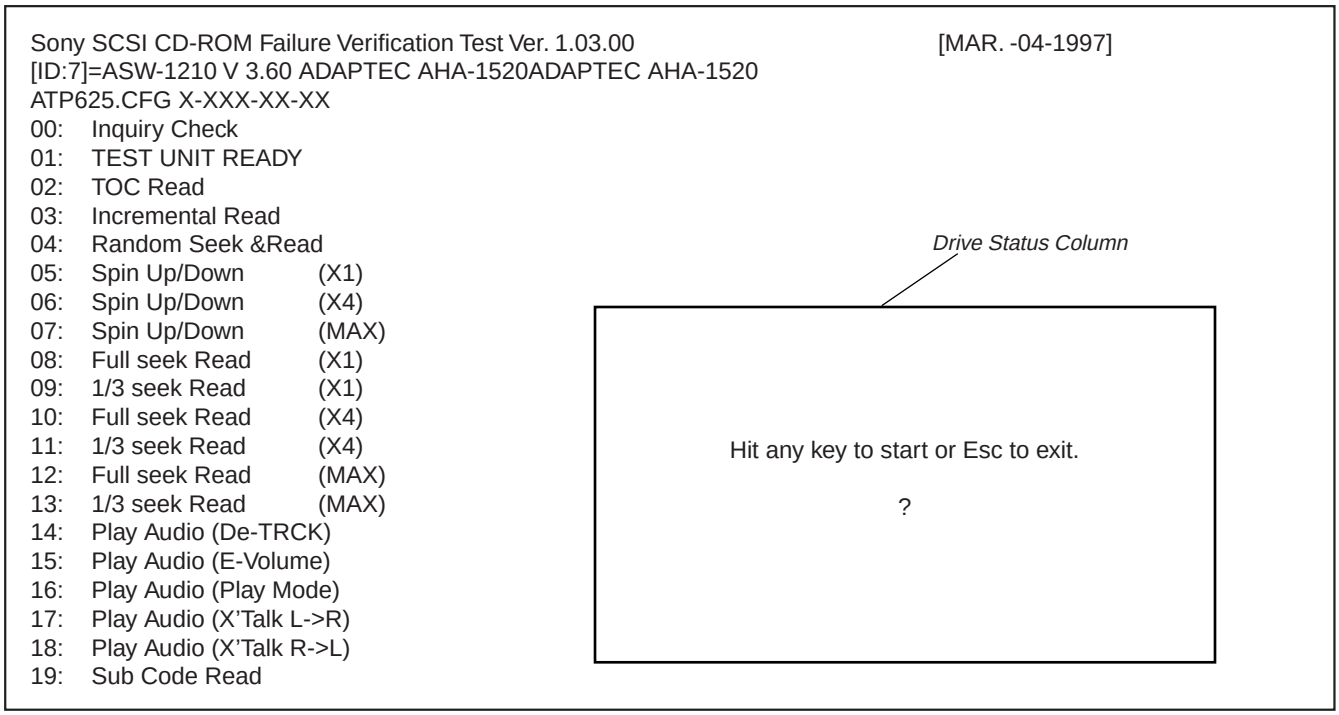
5-2-3. PROCEDURE OF ATP TEST

5-2-3-1. Pre-setting

a. Connect the CDJ-500 to the Computer. (Refer to Fig. 5-1-3-2.)
b. Set the Jumpers on the Adaptec SCSI board. (Refer to Fig. 5-1-3-2.)
c. Set the COMMAND SW of back panel as below.

ID2	ID1	ID0	PARITY
OFF	ON	ON	ON

d. Turn on the power of Computer.
e. After loading the system, "C >" is displayed on the screen. Then, insert ATP625 Disc. (Carry out before starting up with Dos prompt.)
f. Change the directory in the drive A. ("A >" is displayed on the screen.)
g. Type [A][T][P][6][2][5] and hit [Enter] key. (After loading the test program, Display 5-2-3-1. (a) shows up.)

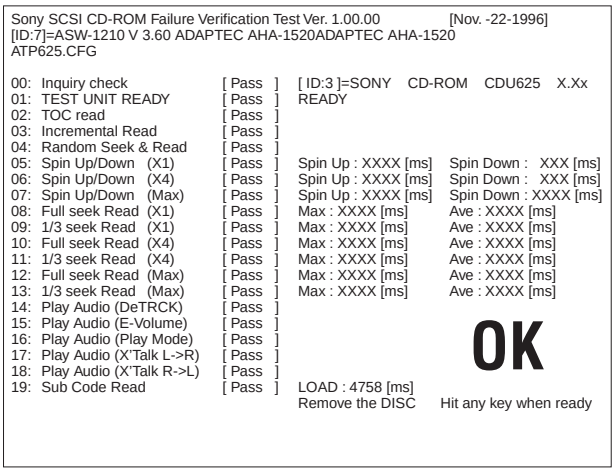

Sony SCSI CD-ROM Failure Verification Test Ver. 1.03.00 [MAR. -04-1997]
[ID:7]=ASW-1210 V 3.60 ADAPTEC AHA-1520ADAPTEC AHA-1520
ATP625.CFG X-XXX-XX-XX
00: Inquiry Check
01: TEST UNIT READY
02: TOC Read
03: Incremental Read
04: Random Seek &Read
05: Spin Up/Down (X1)
06: Spin Up/Down (X4)
07: Spin Up/Down (MAX)
08: Full seek Read (X1)
09: 1/3 seek Read (X1)
10: Full seek Read (X4)
11: 1/3 seek Read (X4)
12: Full seek Read (MAX)
13: 1/3 seek Read (MAX)
14: Play Audio (De-TRCK)
15: Play Audio (E-Volume)
16: Play Audio (Play Mode)
17: Play Audio (X'Talk L->R)
18: Play Audio (X'Talk R->L)
19: Sub Code Read
Drive Status Column
Hit any key to start or Esc to exit.
?

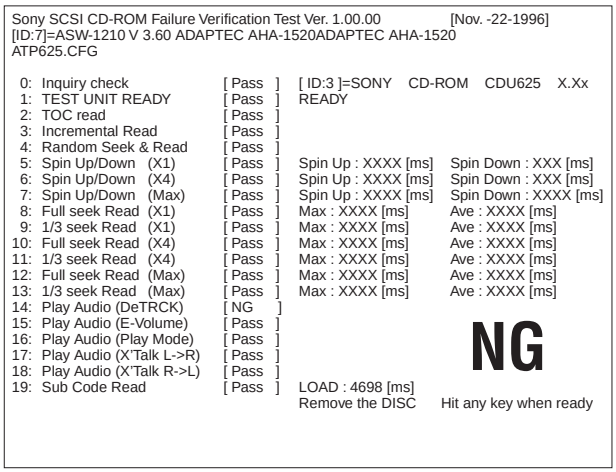
Display 5-2-3-1. (a)

5-2-3-2. Test Procedure

TEST item	Check point
To execute ATP test of the drive. 1. Hit any key to start ATP test. **Note:** When some errors occurr during the test, "[A]bort [R]etry [I]gnore" message will be displayed i=on the drive status column, at that time hit A key to exit and then check which part is broken in accordance with 3-4. **Note:** If each test result satisfies the specification, the word of "Pass" or value of the test result will be displayed on the judgement column. a. Inquity check test will be executed. b. "Returned Data OK ? (Y/N) = >?" message will be displayed on the drive status column, then check the inquiry data and hit [Y] key. c. When "Place CD-ROM TEST DISC (TGRS-21)..." is displayed, press the [OPEN] button of the CDJ-500 to open the door, insert the TGRS-21 DISC to the front slot and close the door. The TEST DISC will be carried to the DRIVE (CDM-56) automatically, and the disc will be chucked. d. TOC Read test will be executed. e. Incremental Read Test will be executed. f. Random Seek & Read test will be executed. g. Spin Up, Spin Down test (normal) will be executed. h. Spin Up, Spin Down test (quadruple) will be executed. i. Spin Up, Spin Down test (Max) will be executed. j. Full seek test (normal) will be executed. k. 1/3 seek test (normal) will be executed. l. Full seek test (quadruple) will be executed. m. 1/3 seek test (quadruple) will be executed. n. Full seek test (Max) will be executed. o. 1/3 seek test (Max) will be executed.	
2. After Seek test completion, Play Audio (DeTRCK) test will be executed. a. "Hit any key when ready" message will be displayed on the drive status column, then hit any key.	The music (both left and right channel) can be heard from the active speaker.
b. Play Audio (E-Volume) test will be executed.	The music (both left and right channel) will be faded-out slowly. (After several minutes, the drive is set to mute mode.)
c. "Any key when Okay or Esc when NG" message will be displayed on the drive status column, then hit any key.	
d. Play Audio (Play Mode) test will be executed.	The music (both left and right channel) can be heard from the active speaker. And the play mode can be changed by pushing some key.
e. "Space bar when ready, ESC to abort" message will be displayed on drive status column, then hit space bar.	(Refer to Drive Status Column)
f. Play Audio (X'Talk L→R) test will be executed.	The sound (only left channel) can be heard for 3 sec. from the active speaker.
g. "Any key when Okay or Esc when NG" message will be displayed on drive status column, then hit any key.	
h. Play Audio (X'Talk R→L) test will be executed.	The sound (only right channel) can be heard for 3 sec. from the active speaker.
i. "Any key when Okay or Esc when NG" message will be displayed on drive status column, then hit any key.	
3. After Audio test completion, Sub Code Read test will be executed.	

TEST item	Check point
4. After sub code Read test completion, Door will be opened automatically. The ATP test ends. **Note:** If all of test items are completed, words of OK will be displayed on the screen.If not, NG will be displayed.	The disc will automatically be unchucked, the door will be opened. Remove the disc when the door is opened.


Sony SCSI CD-ROM Failure Verification Test Ver. 1.00.00 [Nov. -22-1996]
[ID:7]=ASW-1210 V 3.60 ADAPTEC AHA-1520ADAPTEC AHA-1520
ATP625.CFG
00: Inquiry check [Pass] [ID:3]=SONY CD-ROM CDU625 X.Xx
01: TEST UNIT READY [Pass] READY
02: TOC read [Pass]
03: Incremental Read [Pass]
04: Random Seek & Read [Pass]
05: Spin Up/Down (X1) [Pass] Spin Up : XXXX [ms] Spin Down : XXX [ms]
06: Spin Up/Down (X4) [Pass] Spin Up : XXXX [ms] Spin Down : XXX [ms]
07: Spin Up/Down (Max) [Pass] Spin Up : XXXX [ms] Spin Down : XXXX [ms]
08: Full seek Read (X1) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
09: 1/3 seek Read (X1) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
10: Full seek Read (X4) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
11: 1/3 seek Read (X4) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
12: Full seek Read (Max) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
13: 1/3 seek Read (Max) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
14: Play Audio (DeTRCK) [Pass]
15: Play Audio (E-Volume) [Pass]
16: Play Audio (Play Mode) [Pass]
17: Play Audio (X'Talk L->R) [Pass]
18: Play Audio (X'Talk R->L) [Pass]
19: Sub Code Read [Pass]
OK
LOAD : 4758 [ms]
Remove the DISC
Hit any key when ready


Sony SCSI CD-ROM Failure Verification Test Ver. 1.00.00 [Nov. -22-1996]
[ID:7]=ASW-1210 V 3.60 ADAPTEC AHA-1520ADAPTEC AHA-1520
ATP625.CFG
0: Inquiry check [Pass] [ID:3]=SONY CD-ROM CDU625 X.Xx
1: TEST UNIT READY [Pass] READY
2: TOC read [Pass]
3: Incremental Read [Pass]
4: Random Seek & Read [Pass]
5: Spin Up/Down (X1) [Pass] Spin Up : XXXX [ms] Spin Down : XXX [ms]
6: Spin Up/Down (X4) [Pass] Spin Up : XXXX [ms] Spin Down : XXX [ms]
7: Spin Up/Down (Max) [Pass] Spin Up : XXXX [ms] Spin Down : XXXX [ms]
8: Full seek Read (X1) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
9: 1/3 seek Read (X1) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
10: Full seek Read (X4) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
11: 1/3 seek Read (X4) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
12: Full seek Read (Max) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
13: 1/3 seek Read (Max) [Pass] Max : XXXX [ms] Ave : XXXX [ms]
14: Play Audio (DeTRCK) [NG]
15: Play Audio (E-Volume) [Pass]
16: Play Audio (Play Mode) [Pass]
17: Play Audio (X'Talk L->R) [Pass]
18: Play Audio (X'Talk R->L) [Pass]
19: Sub Code Read [Pass]
NG
LOAD : 4698 [ms]
Remove the DISC
Hit any key when ready

Note:
Even if one of items has an “NG”, the result of test will be reqarded as NG.

5-2-4. DRIVE FUNCTION CHECK

Since CDM-56 models is adjustment-free drive, there is no potentiometer fo electrical adjustment in the MA-C30 Mounted Board. Therefore BU or MA Mounted Board can be swapped over without any manual adjustment so that you will easily find defective components (if the trouble depends on BU or MA Mounted Board). (Refer to 5-2-4-2.)

Note: All of adjustment items, will be automatically performed after power-on by the function of CD DSP IC.
The page 23 shows the sequence of execution items in Power-On Reset Actions. It will help you finding any defective point on the drive to know the specified processing sequence of the auto adjustment items and drive's action in the Power-On Reset Actions.

Preparing

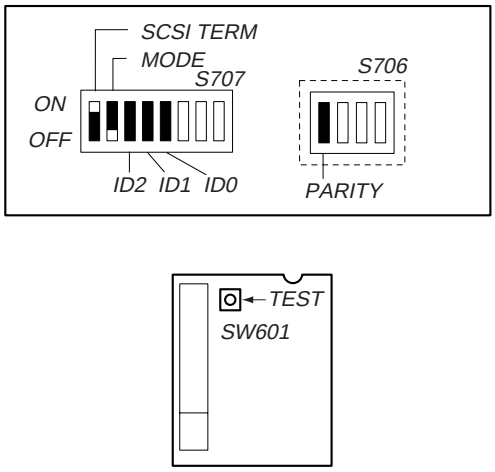
The following tools and measuring equipments are necessary for performing this section.

Oscilloscope
Sony Test Disc (YEDS-18) (3-702-101-01)

5-2-4-1. Pre-Setting for Test Mode Operation

Note: This section is performed only specified following sections.

Note: This section describes usages of Test Mode Operation and signal checking on the CDM-56 drives with the with the COMMAND SW on the back panel and the TEST button (MAIN board).



a. Set the COMMAND SW on the back panel as below.

ID2	ID1	ID0	PARITY
ON	OFF	ON	ON

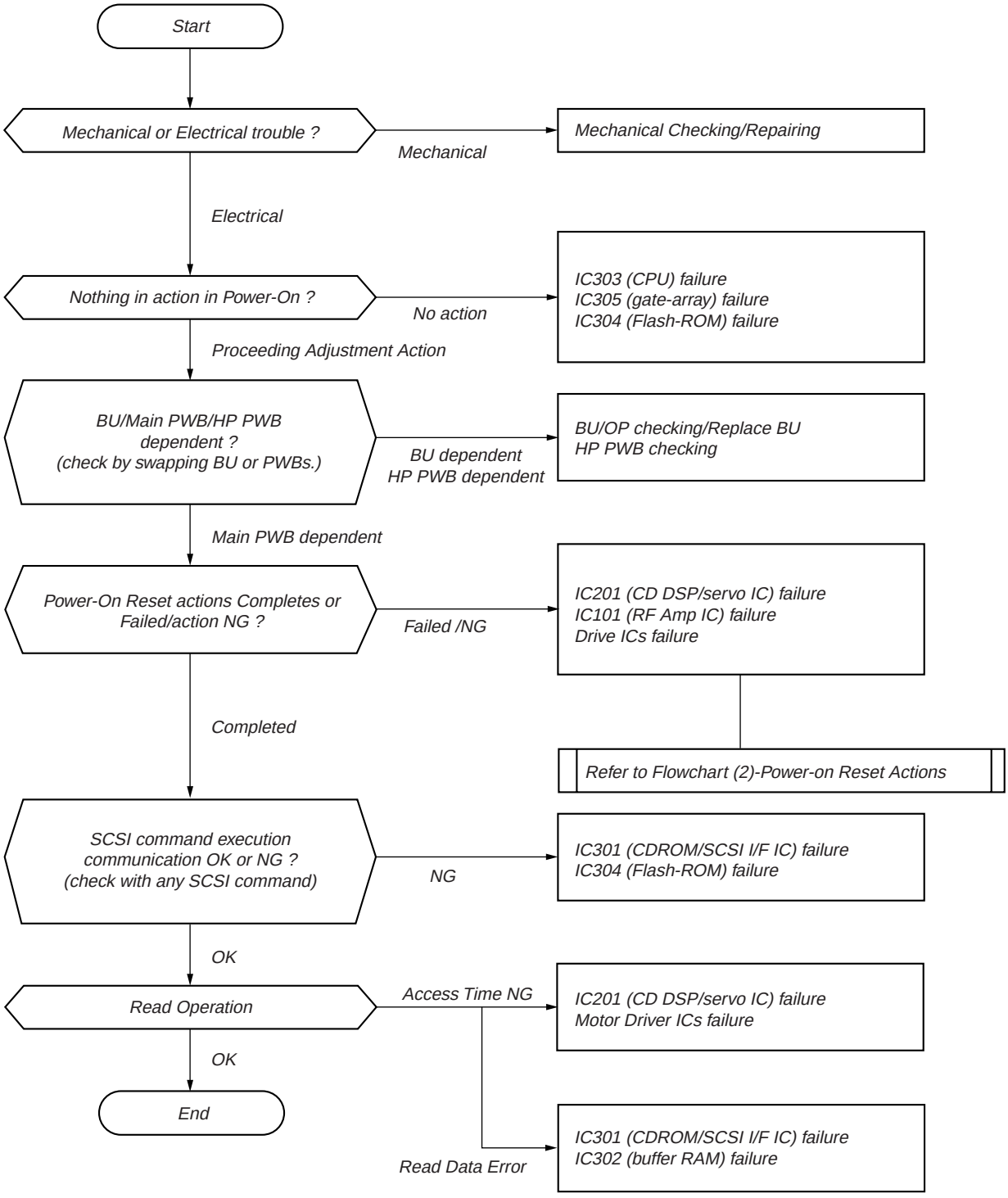
b. While pressing the TEST button of the controller, turn on the power of the CDJ-C50S.

d. About 1 second later, release the TEST button.

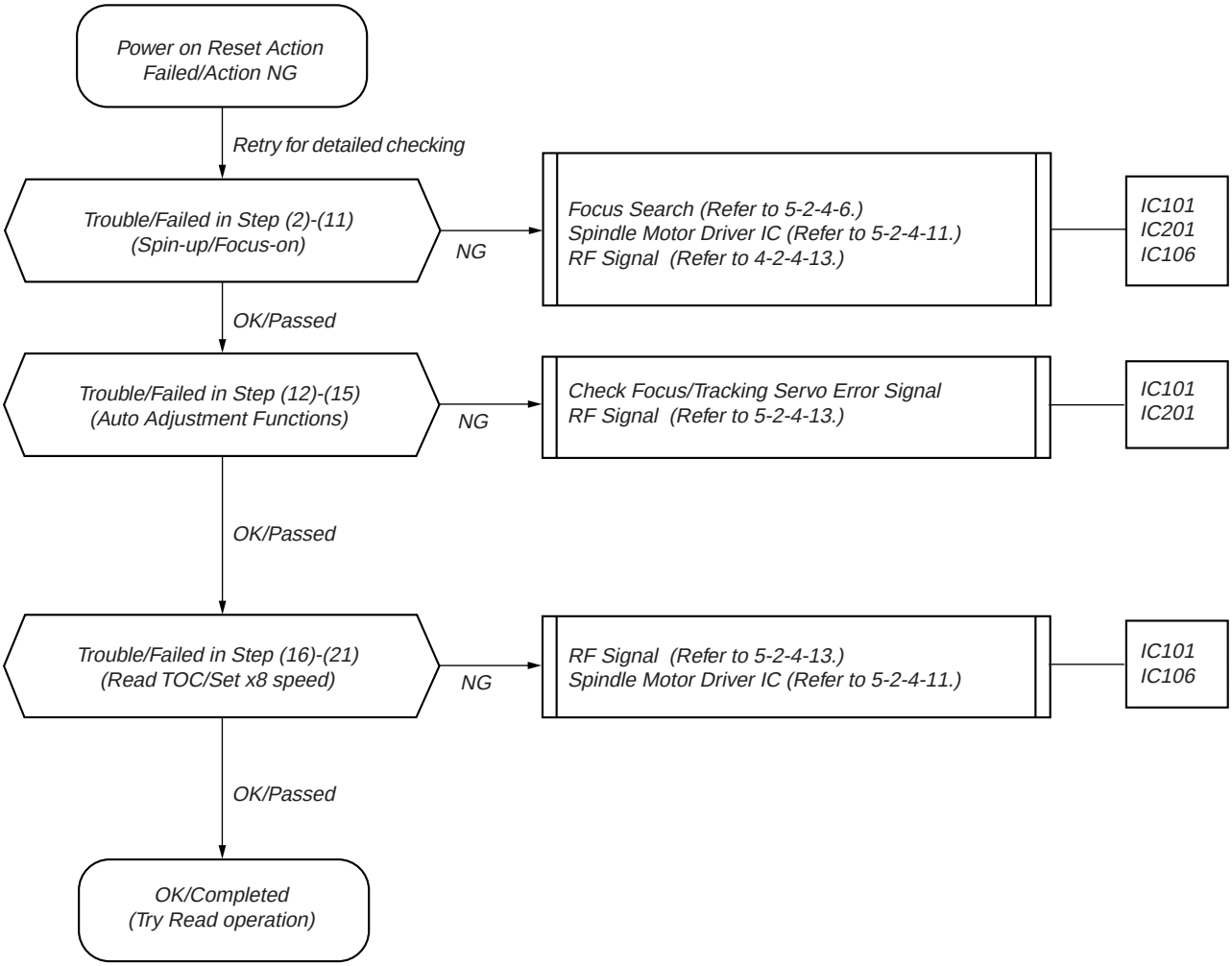
Note: Even if drive is Test Mode, OPEN button is activated.

5-2-4-2. Flowchart

Note: These flowchart is described assuming that IC failure causes any trouble.



Flowchart (1) Repairing/Trouble Shooting-General



Flowchart (2) Repairing/Trouble Shooting-Power-on Reset Actions

Power on Reset Actions

Step	Item	Drive Action
(1)	Drive Power-On	
(2)	Sled Offset/Hall element Adjustment	
(3)	Tentative spindle servo gain setting	
(4)	LD On	LD to turn on
(5)	Focus Search	OP lens to move up and down
(6)	Focus On	
(7)	Spindle servo gain setting	
(8)	Tracking Servo On	
(9)	Spindle Servo On	
(10)	— sync pattern detection —	
(11)	Focus Bias Voltage Auto Adjustment	
(12)	Focus Servo Gain Auto Adjustment	(You will hear a small beep sound from the drive during these auto adjustment.)
(13)	Track Servo Gain Auto Adjustment	
(14)	— sync pattern detection —	
(15)	Disc Diameter (8cm/12cm) Detection	(You will see RF Signal with Spindle-Kicking waveform.)
(16)	Read TOC	
(17)	Jump to 00:02:00	
(18)	— Subcode-Q detection —	
(19)	Disc Linear Speed Detection	
(20)	Set max. rotational speed	
(21)	— sync pattern detect & subcode-Q detection—	
	— Completed —	

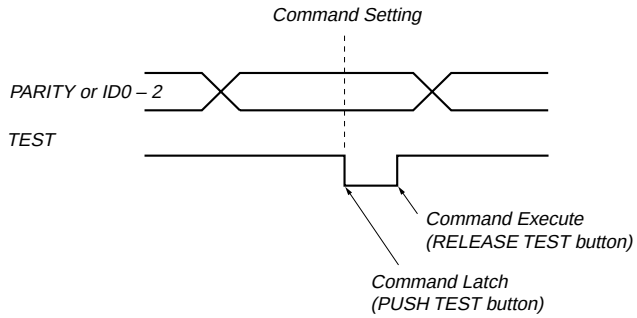
Note: When a disc is replaced, the above steps excluding item (1) to (3) will be executed.
The item (1) to (3) will be performed only after power-on.

5-2-4-3. Test Command List

ID2	ID1	ID0	PARITY	Drive Action
ON	ON	ON	ON	Initialize Drive
ON	ON	OFF	ON	Set Normal Speed
ON	OFF	ON	ON	Set Quadruple Speed
OFF	OFF	ON	ON	Play Audio (from 23'47")
ON	ON	ON	OFF	Tracking Servo on
ON	ON	OFF	OFF	Tracking Servo off
OFF	ON	OFF	ON	Play Audio (from 5'00")
OFF	OFF	OFF	ON	Play Audio (from 50'00")
OFF	ON	ON	ON	Partial CAV (x12–x24)

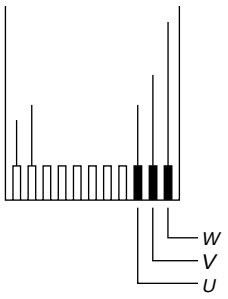
OFF : PARITY or ID0 – 2 test point to be high (5V).
ON : PARITY or ID0 – 2 test point to be low (Ground).

Command Execute
In the test mode, above listed function can be executed. Turn on COMMAND SW on the back panel of CDJ-500.
The command will be latched by TEST down edge, and executed by rising edge.



5-2-4-4. Spindle Motor

Check resistance
a. Pull the spindle motor flexible cable out from the connector.
b. Measure the resistance between 3 motor terminals respectively (u-v, v-w, w-u).
c. The resistance shall be 8Ω ± 10%.
d. Otherwise replace the motor.



Check noise from spindle motor
a. Listen carefully the sound from the spindle motor while drive is spinning up.
b. If you hear the strong striking noise from the motor, it is suspected that there is too much clearance between the bearing metal and the shaft, that is; NG motor!!

Note: As the CDM-56 adopts the CAM motor for the spindle motor, clattering sounds of the ball bearings are produced during spinning up and spinning down.
Differentiate these from slipping sounds.

5-2-4-5. Sled Gear Train

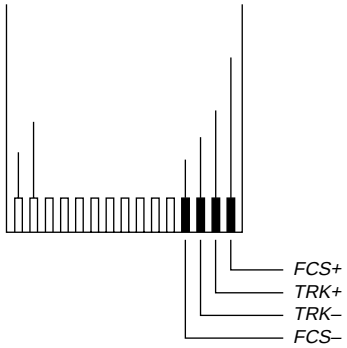
Check the mechanical burden

a. Disassemble the CHUCK HOLDER.
b. Check if there is any broken tooth in the gears.
c. Try to move sled gears by hand and check if it gets unsmooth in certain position.
d. In case there is unsmooth protion, replace Base Unit Ass'y.

5-2-4-6. 2-Axis Actuator

Check Focus search operation

a. Disassemble the CHUCK HOLDER so that the optical pick-up is exposed.
b. Turn on the drive power and watch if the objective lens moves upward and downward.
c. If the lens does not move, check the resistance of the 2-axis actuator coils. It should be 6.1±1.1Ω between FCS+ and FSC–.



d. Otherwise replace the optical device.
e. If the coils are normal, replace the Driver IC (IC103).

5-2-4-7. Focusing (Focus Bias)

a. Insert any discs into the drive after the check of 5-2-4-4.
b. Check if the drive can make a focus.
c. In case of failure, it is possible that Focus Bias or Focus Gain Servo circuit had not been controlled well.
d. So watch RF signal by a oscilloscope and see if the quality is good or not.
e. In case the quality is not good, check servo circuit.

5-2-4-8. Laser Power

Check Laser beam

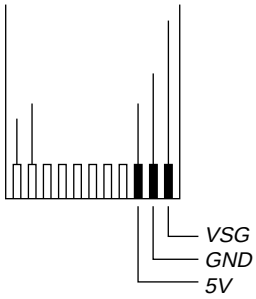
a. Disassemble the drive so that the optical device is exposed.
b. Turn on the drive power and look into the objective lens carefully while the drive is in process of focus search.
c. Check if the red beam comes out from the optical pick-up.
Warning: Do not look into LD beam closely with naked eyes.
d. In case of no beam from optical device, the LD must have been broken down, so replace the optical pick-up.

Check Laser Current

a. Touch the IOP test land [IOP] on the MA-C30 Mounted Board.
b. Measure the voltage generated by the laser current while the drive in process of focus search.
c. It is supposed to be about 4.5V because the voltage of IOP will drop by IOP x10Ω from 5V-A.
d. Otherwise replace the optical pick-up.

Check G Sensor

a. Pull the SE-C7 P. W. B. cable out from the connector.
b. Measure the resistance between 3 terminals respectively. (VSG-GND, GND-5V)
c. The resistance should be 3.7 ± 1MΩ between VSG and GND, and 94 ± 6kΩ between GND and 5V.



5-2-4-9. Chucking Mechanism

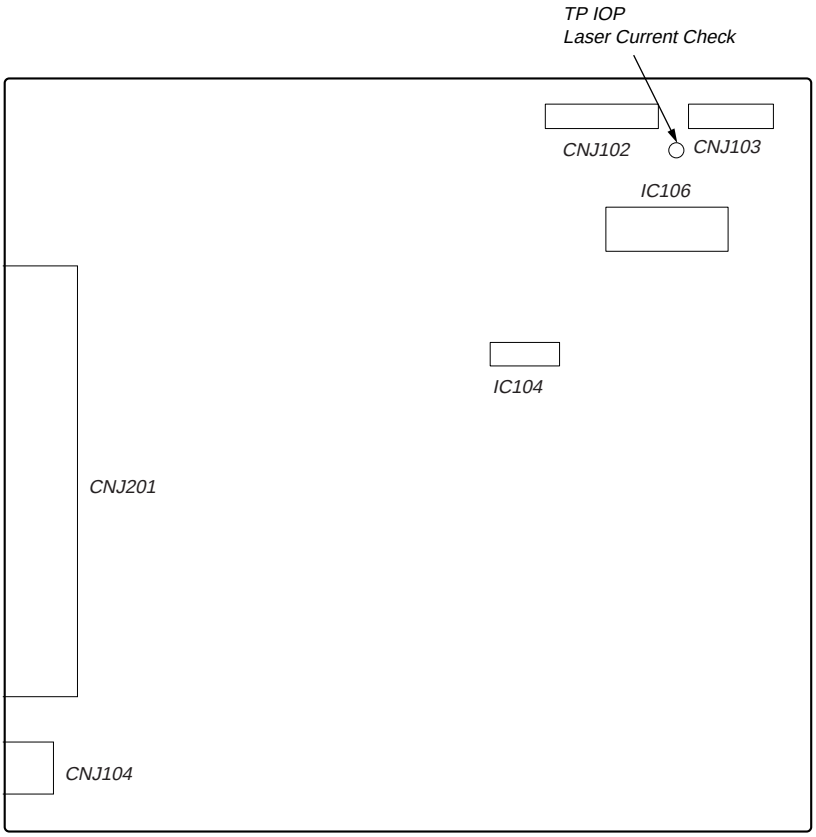
a. Listen the sound from the drive while the drive is spinning up.
b. Check if there is any slipping noise among the Turntable, the Chucking Pulley Ass'y and the Disc.
c. If you hear any, check the mechanical adjustments (SECTION 4).
d. Otherwise disassemble the drive and check if there is excessive dust or any contamination on the Turntable or the disc.

Note: As the CD-56 adopts the VCAN (Vibration Cancel) motor for the spindle motor, clattering sounds of the ball bearings are produced during spinning up and spinning down. Differentiate these from slipping sounds.

5-2-4-10. Sled Motor

a. Disconnect the SE-C7 P. W. B. cable from the SE-C7 board.
b. Check the resistance between 2 terminals of sled motor.
c. It should be 10.8Ω ± 10%.

[MA-C30 BOARD] (SIDE B)



5-2-4-11. EF Balance

Note:
- Before performing electrical block checks, solder a lead wire to TP RF EQ, TP VC, and TP TE of the MA-C30 board.
- Chuck the disk (YEDS-18) beforehand.
- Refer to 5-2-4-1. and set the test mode.
- Insert a SONY test disc (YEDS-18) into the test drive.
- Press the OPEN button to open the door, place the disc in the slot in front, close the door to chuck the disc.

1. Connect the oscilloscope to TP TE and TP VC of the MA-C30 board.
2. Set the COMMAND SW of the controller to INITIALIZE and press the TEST button.

ID2	ID1	ID0	PARITY
ON	ON	ON	ON

3. Set the COMMAND SW of the controller to x1 speed, and press the TEST button.

ID2	ID1	ID0	PARITY
ON	ON	OFF	ON

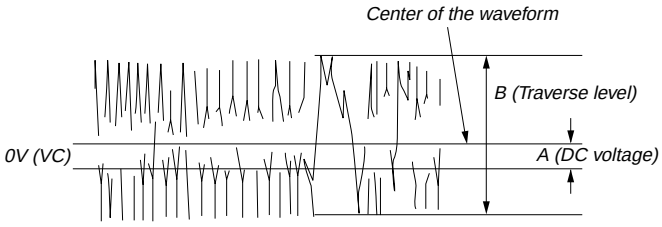
4. Set the COMMAND SW of the controller to Play Audio (23'47"), and press the TEST button.

ID2	ID1	ID0	PARITY
OFF	OFF	ON	ON

5. Set the COMMAND SW of the controller to tracking off, and press the TEST button.

ID2	ID1	ID0	PARITY
ON	ON	OFF	OFF

6. Check the level B of the oscilloscope's waveform and the A (DC voltage) of the center of the Traverse waveform.
   Confirm the following:
   • A/B x 100 = less than ±22 (%)



7. After checking, set the COMMAND SW of the controller to tracking on, and press the TEST button.

ID2	ID1	ID0	PARITY
ON	ON	ON	OFF

5-2-4-12. RF Level

Note:
- Before performing electrical block checks, solder a lead wire to TP RFEQ and TP VC of the MA-C30 board.
- Chuck the disk (YEDS-18) beforehand.
- Refer to 5-2-4-1. and set the test mode.
- Press the OPEN button to open the door, place the disc in the slot in front, close the door to chuck the disc.

1. Connect the oscilloscope to TP RF and TP VC of the MA-C30 board.
2. Set the COMMAND SW of the controller to INITIALIZE and press the TEST button.

ID2	ID1	ID0	PARITY
ON	ON	ON	ON

3. Set the COMMAND SW of the controller to x1 speed, and press the TEST button.

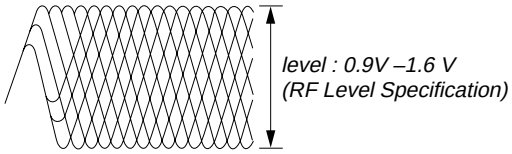
ID2	ID1	ID0	PARITY
ON	ON	OFF	ON

4. Set the COMMAND SW of the controller to Play Audio (23' 47"), and press the TEST button.

ID2	ID1	ID0	PARITY
OFF	OFF	ON	ON

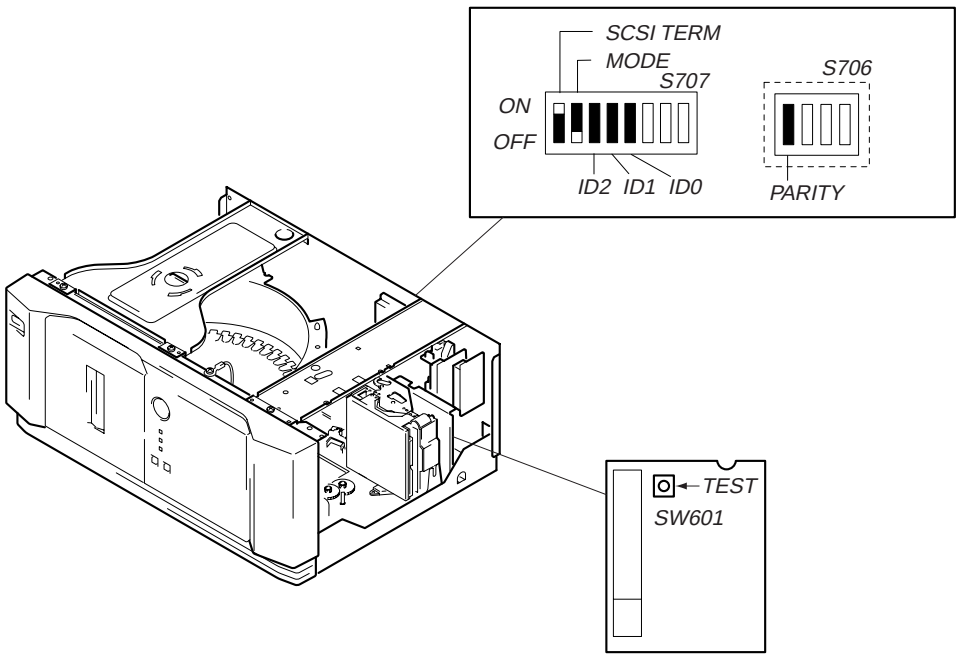
5. Check that the oscilloscope waveform is clear, and the RF level is proper.

* A clear RF signal waveform is as follows.



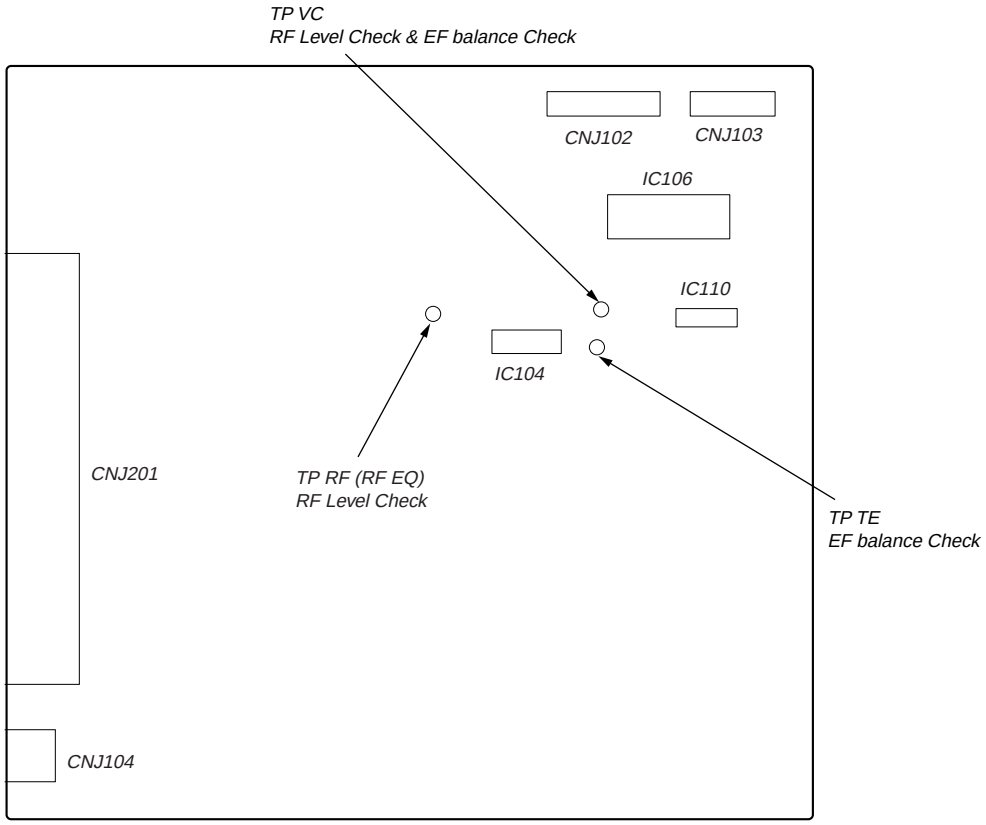
Removing the disc
Press the OPEN button. The disc unloads from the drive, comes to the front automatically, and the door opens.

Loading the disc
Press the OPEN button to open the door, place the disc in the slot in front, then close the door with your hand.
The disc will automatically be chucked in the drive.



Adjustment Location :

[MA-C30 BOARD] — Side B —



SECTION 6
THEORY OF OPERATION

P-CAV Drive

By using latest P-CAV (partical CAV) technology, the CDM-56 realizes data transferring with variable transfer rate, from 12* (inner track) to 24X (outer track).
Achieving 20X (3000kBytes/s) average data transfer rate, the CDM-56 shows excellent performance.
*In the case of scanning velocity 1.3m/s and 60 min. disk reading.

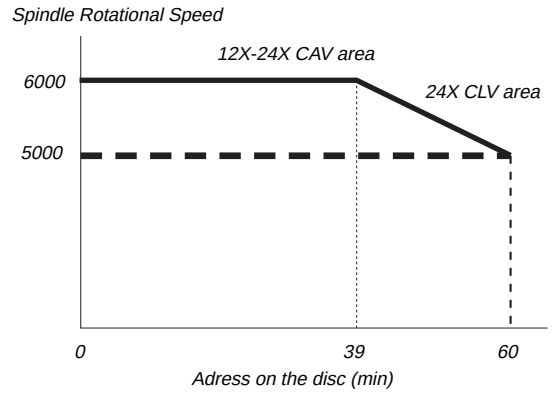
FUNCTION OF PARTICAL CAV
CDM-56 (Drive unit) features Partical CAV capability for Maximum Speed, taking advantage of Wide Capture Range capability of PLL (Phase Locked Loop) in its fastest speed mode.

Refer to the illustration on the left-hand side;

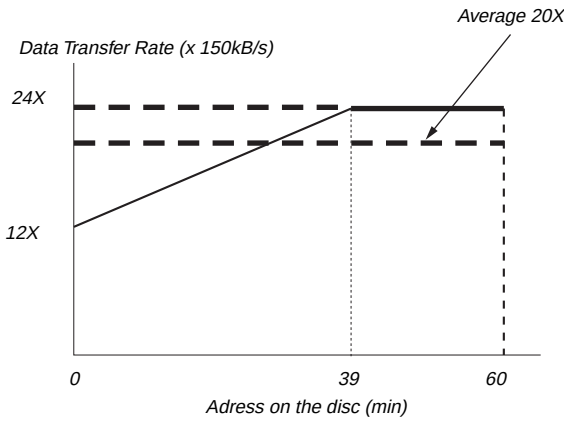
Spindle Motor rotates constantly at approximately 6,000 rpm, equal to the rotational speed of 12X CLV on the innermost track, in the area between the innermost track and the point of approximately 39 minuites (CAV area).

In the disc area outside the fore said 39 minutes, the spindle motor follows the spindle speed curve of 24X CLV (CLV area).

Spindle Rotational Speed



Data Transfer Rate



Disc In Balalaned Disc cancellation function

① VCAN (Vibration Cancel) motor adopted by SPINDLE
CDM-56 has new type of spindle motor that cancels imbalance of a disc automatically. Thanks to the new spindle motor, self -vibration of the drive is reduced when the drive reads the imbalance disc.

② Shock sensor adopted
CDM-56 has a feature that can detect excess vibration caused by imbalance disc. Thanks to this feature, CDM-56 (CDM-57) automatically reduce it's spindle speed to 8X-20X CAV mode when such imbalance disc is inserted. It contributes to less vibration, less audible noise, better readability and provides comfortable operating condition to end user.

Capable of Reading CD-RW disc

CDM-56 has the capability of reading CD-RW disc. CDM-56 can automatically adjust RF amp gain and error amp gain to the proper value for CD-RW disc, when CD-RW disc is inserted. But CDM-56 can read CD-RW disc only at 4X speed.

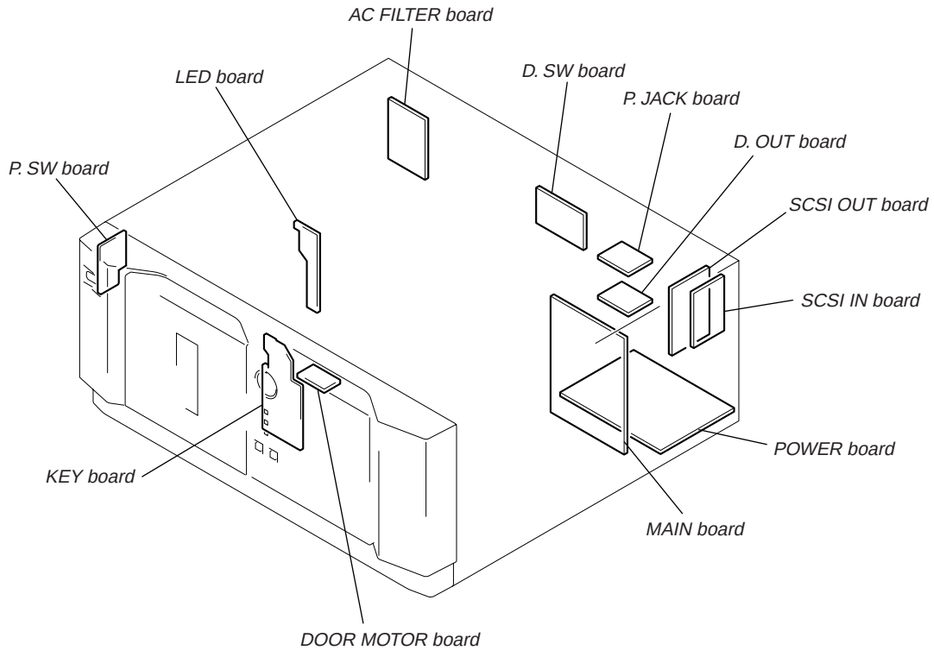
Fast Access Time

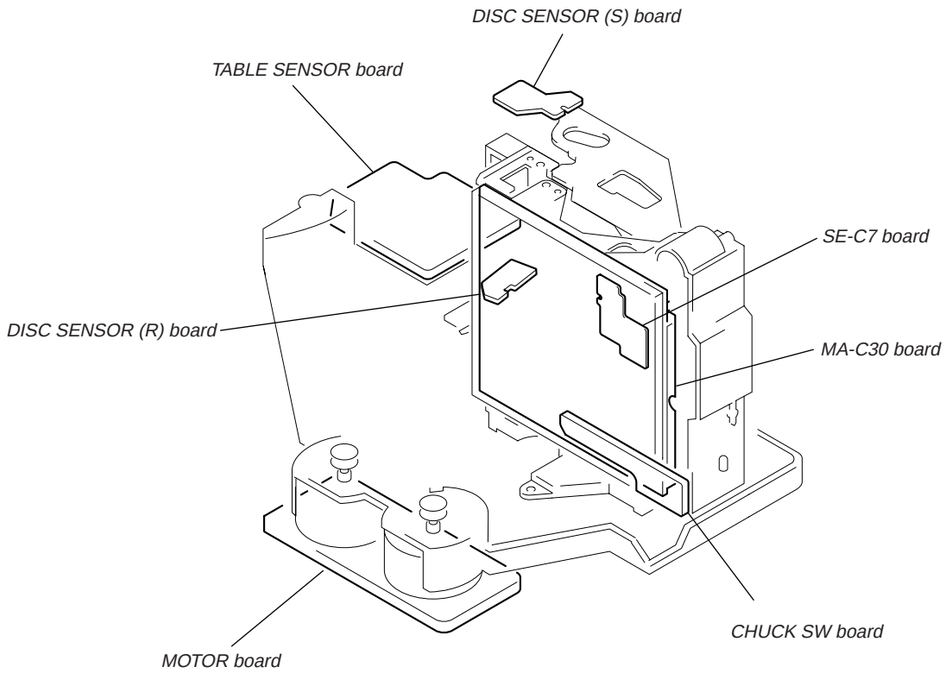
Random access time is 90 ms* at P-CAV mode, which reduces vibration of spindle rotational speed so that the access time improved.

Power Saving Mode

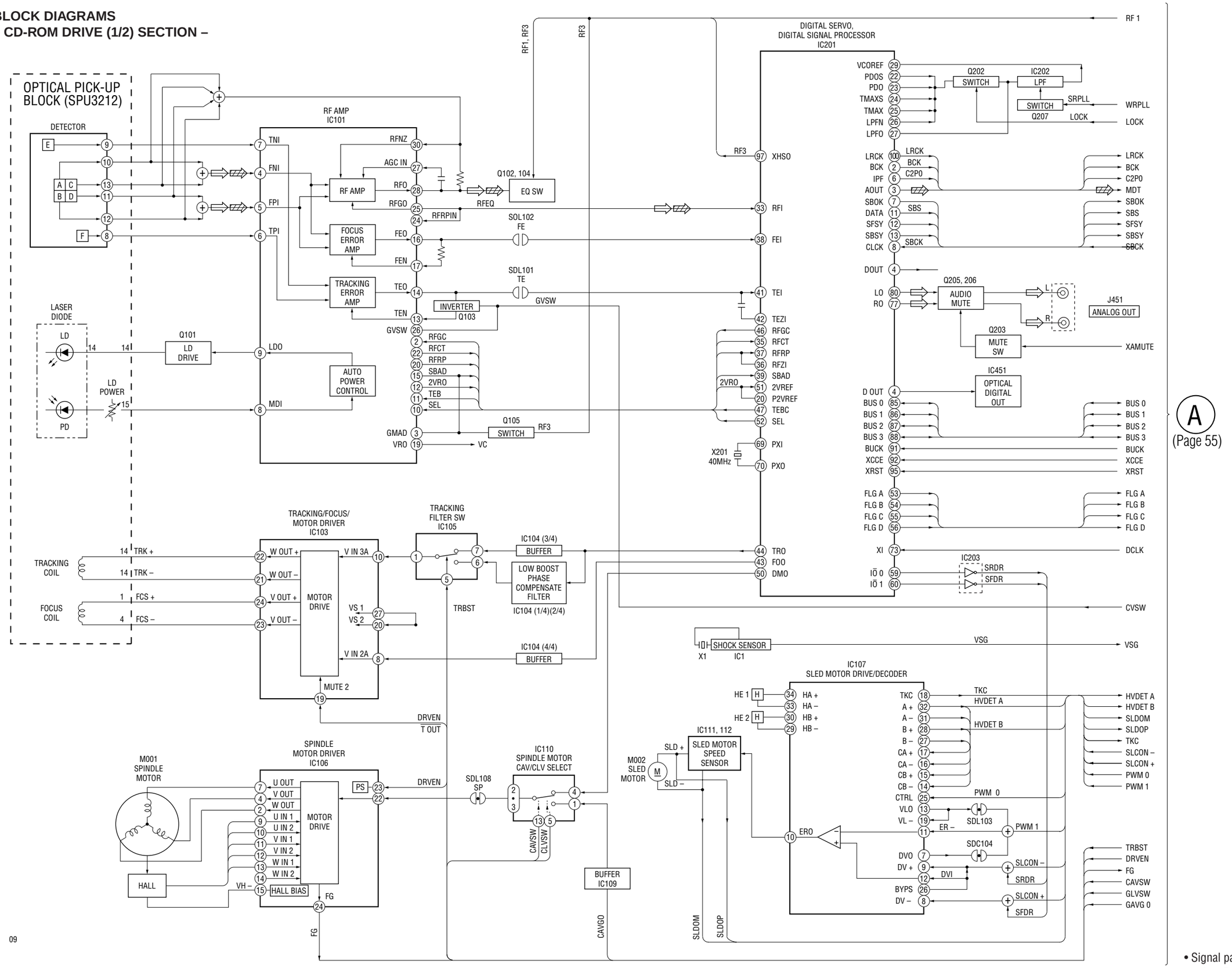
CDM-56 has a power saving mode. If any command which requires disc access (such as READ or SEEK command) is not issued to the drive for more than the inactivity time, which can be set by mode select command, the drive goes into "standby mode" automatically. Any command that requires disc access can resume the drive from "standby mode".

SECTION 7
DIAGRAMS



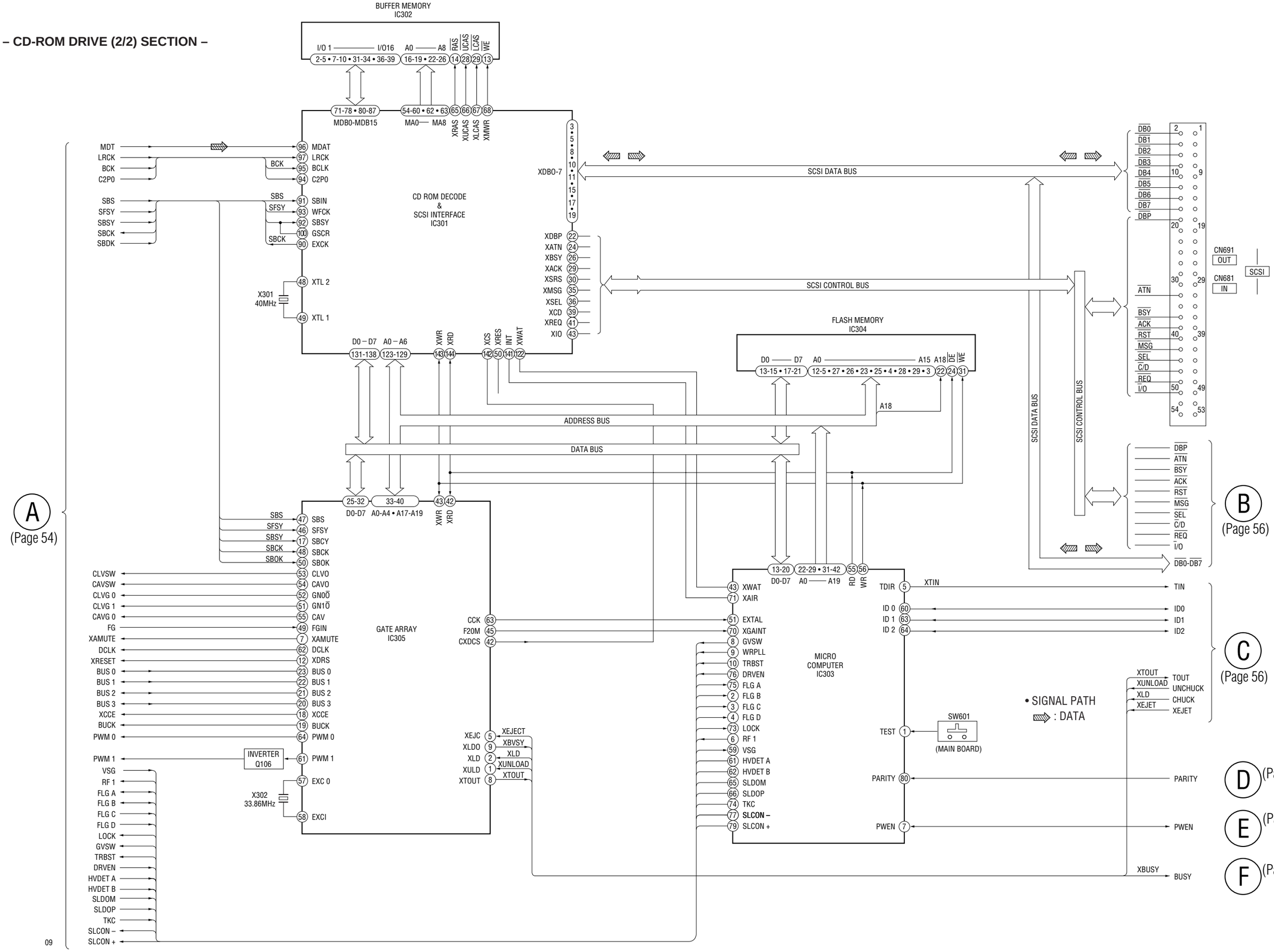


7-2. BLOCK DIAGRAMS
– CD-ROM DRIVE (1/2) SECTION –

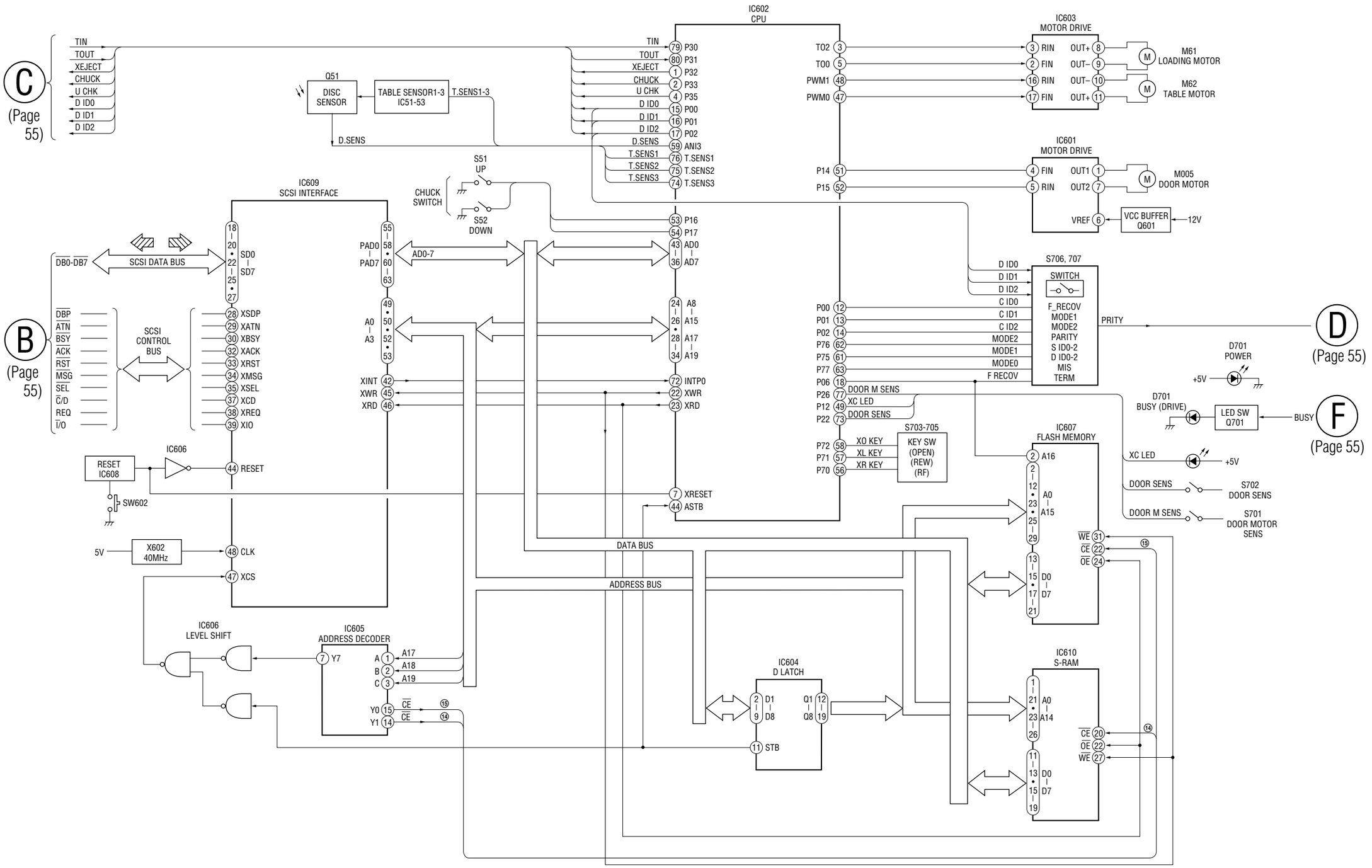


• Signal path
▱▷ : DATA
▭▷ : AUDIO

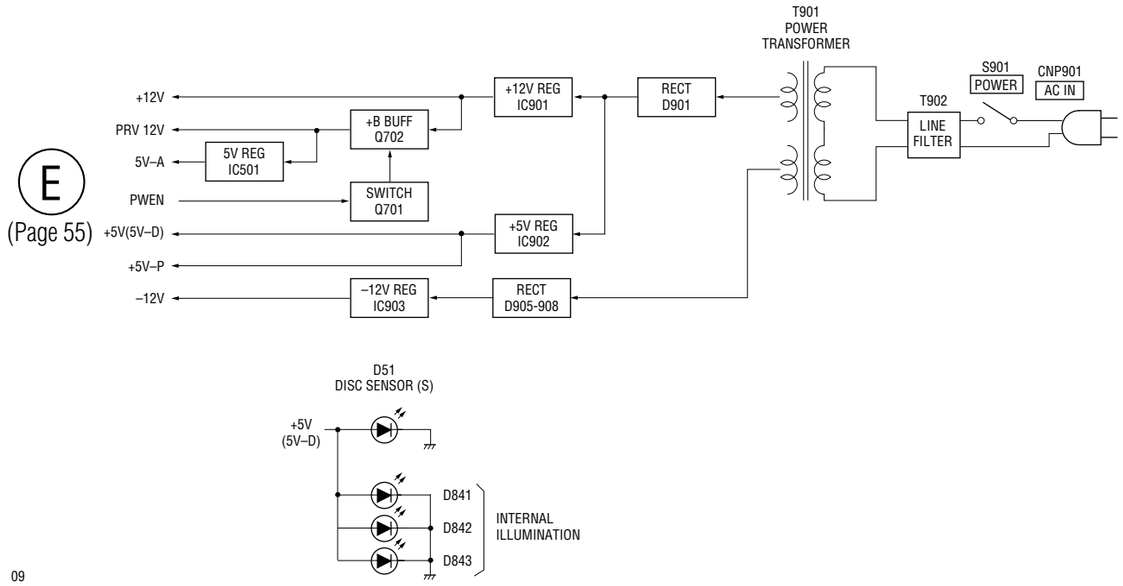
– CD-ROM DRIVE (2/2) SECTION –



– MAIN SECTION –



– POWER SUPPLY SECTION –



09

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For schematic diagrams.

Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- ▭ : panel designation.

Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

- B+ : B+ Line.
- B– : B– Line.
- ▭ : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : STOP
  ( ) : PLAY
  * : can not be mounted
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : CD
  ⇨ : AUDIO
- Abbreviation
  CND : Canadian model.

For printed wiring boards.

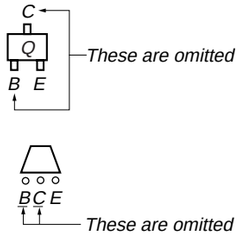
Note:

- ○—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- ■ : parts mounted on the conductor side.
- ○ : Through hole.
- ▒ : Pattern from the side which enables seeing.

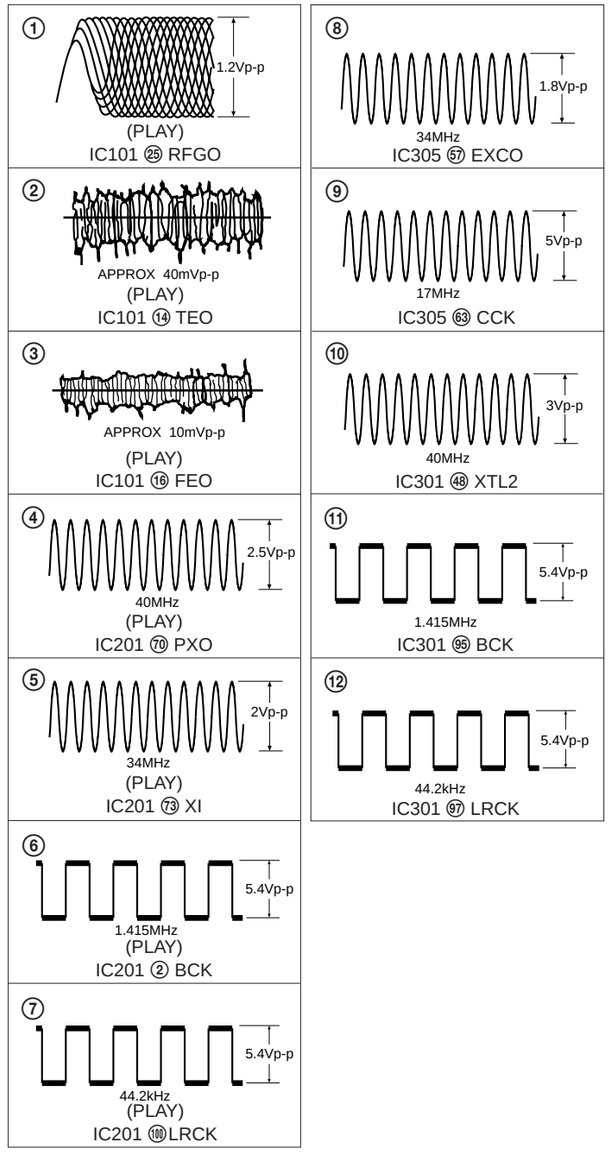
(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

- **Indication of transistor**



WAVEFORMS
– CD ROM SECTION –

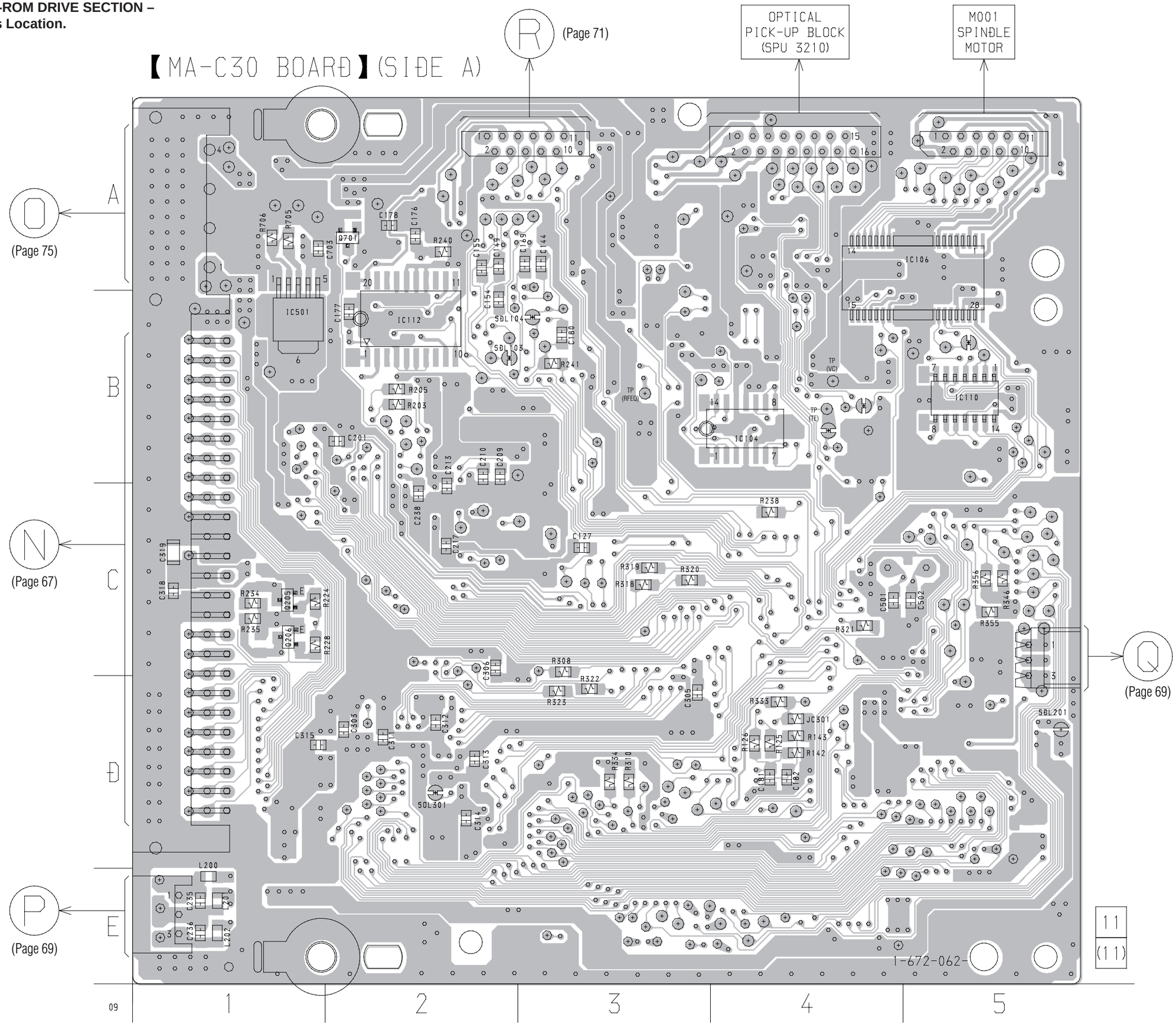


7-3. PRINTED WIRING BOARD – CD-ROM DRIVE SECTION –

• See page 53 for Circuit Boards Location.

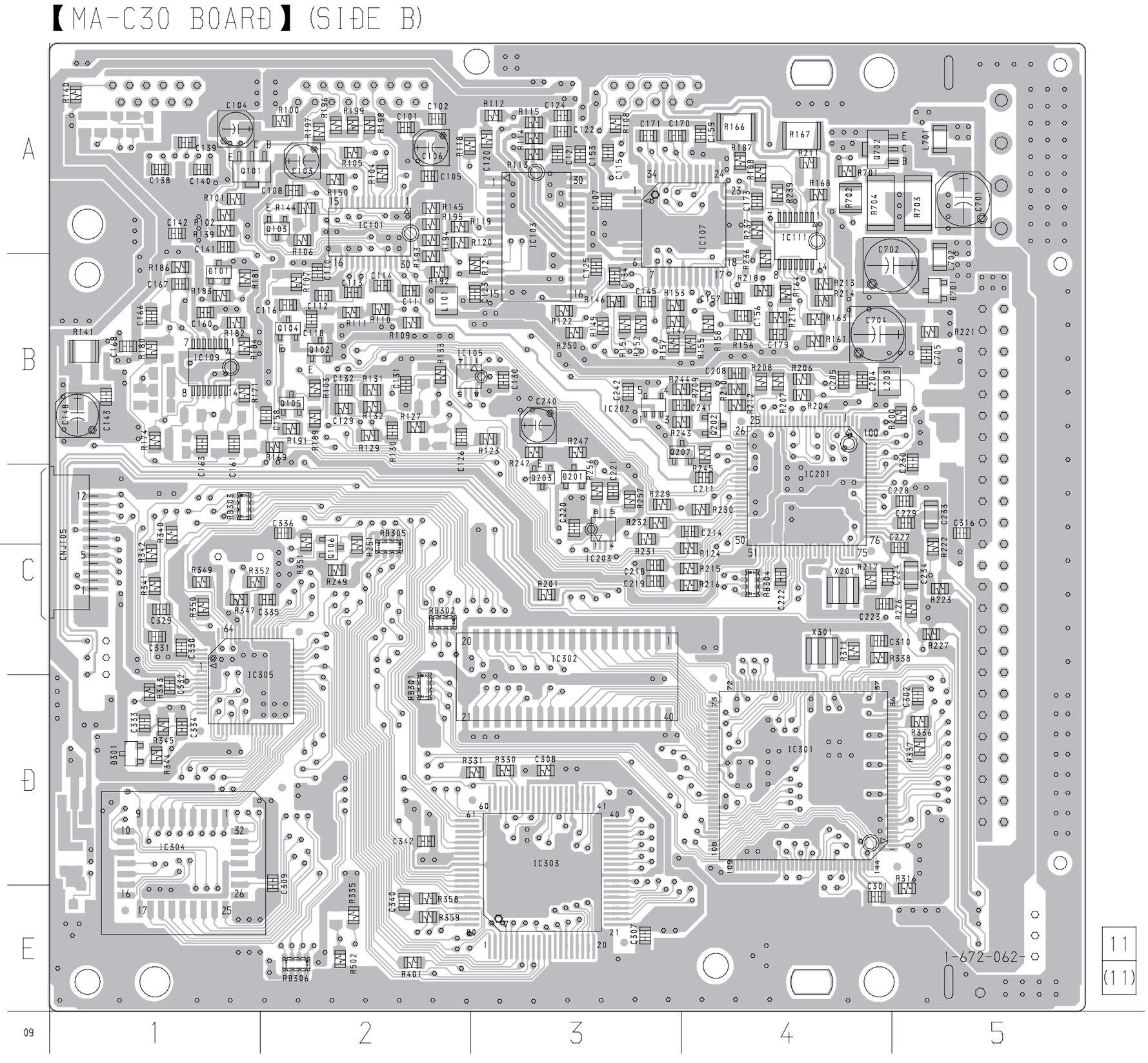
• **Semiconductor Location**

Ref. No.	Location
IC104	B-4
IC106	B-5
IC110	B-5
IC112	B-2
IC501	B-2
Q205	C-2
Q206	C-2
Q701	A-2



7-4. PRINTED WIRING BOARD – CD-ROM DRIVE SECTION –

• See page 53 for Circuit Boards Location.

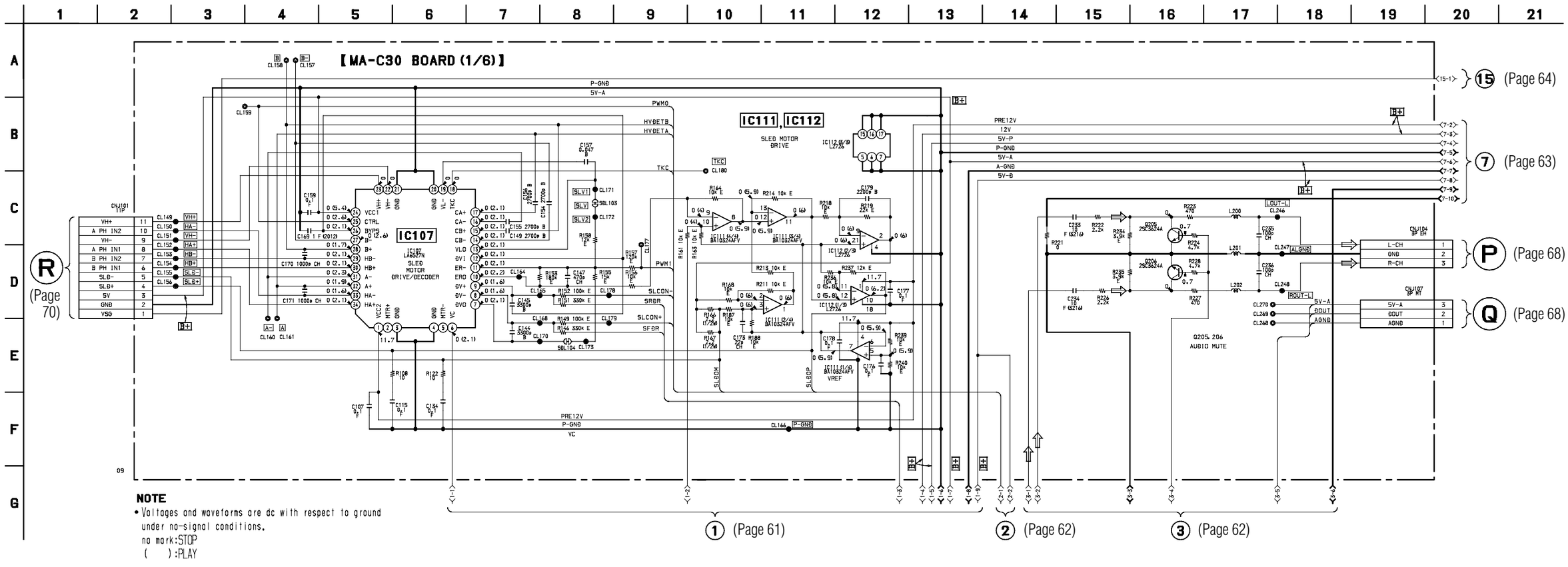


- **Semiconductor Location**

Ref. No.	Location
D101	B-1
D201	C-3
D301	D-1
D701	B-5
IC101	A-2
IC103	A-3
IC105	B-3
IC107	A-3
IC109	B-1
IC111	B-4
IC201	C-4
IC202	B-3
IC203	C-3
IC301	D-4
IC302	D-3
IC303	D-3
IC304	D-1
IC305	D-1
Q101	A-1
Q102	B-2
Q103	A-2
Q104	B-2
Q105	B-2
Q106	C-2
Q202	B-4
Q203	C-3
Q207	B-3
Q702	A-4

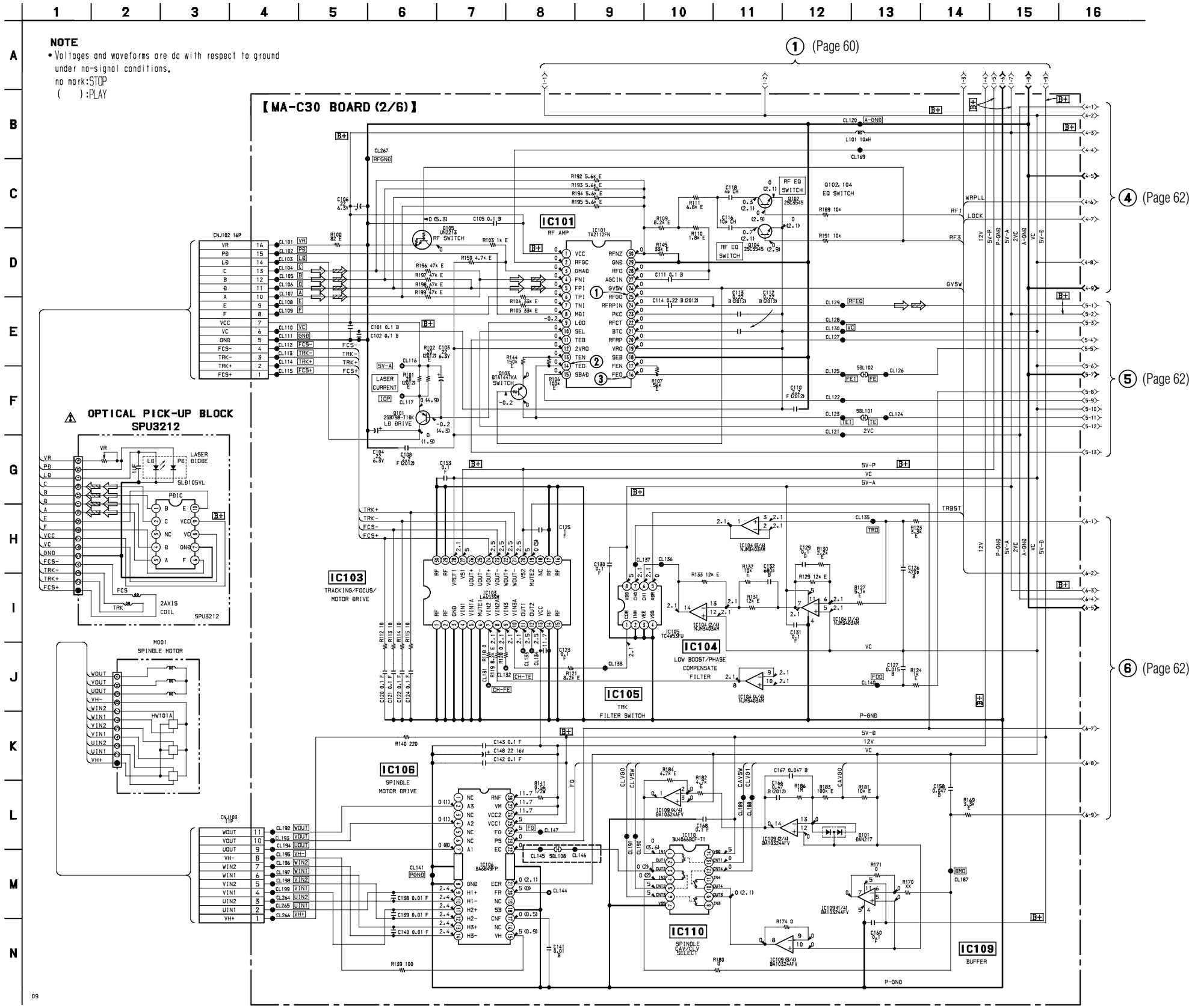
7-5. SCHEMATIC DIAGRAM – CD-ROM DRIVE (1/6) SECTION –

- **See page 57 for Waveforms.**
- **See page 76 for IC Block Diagrams.**



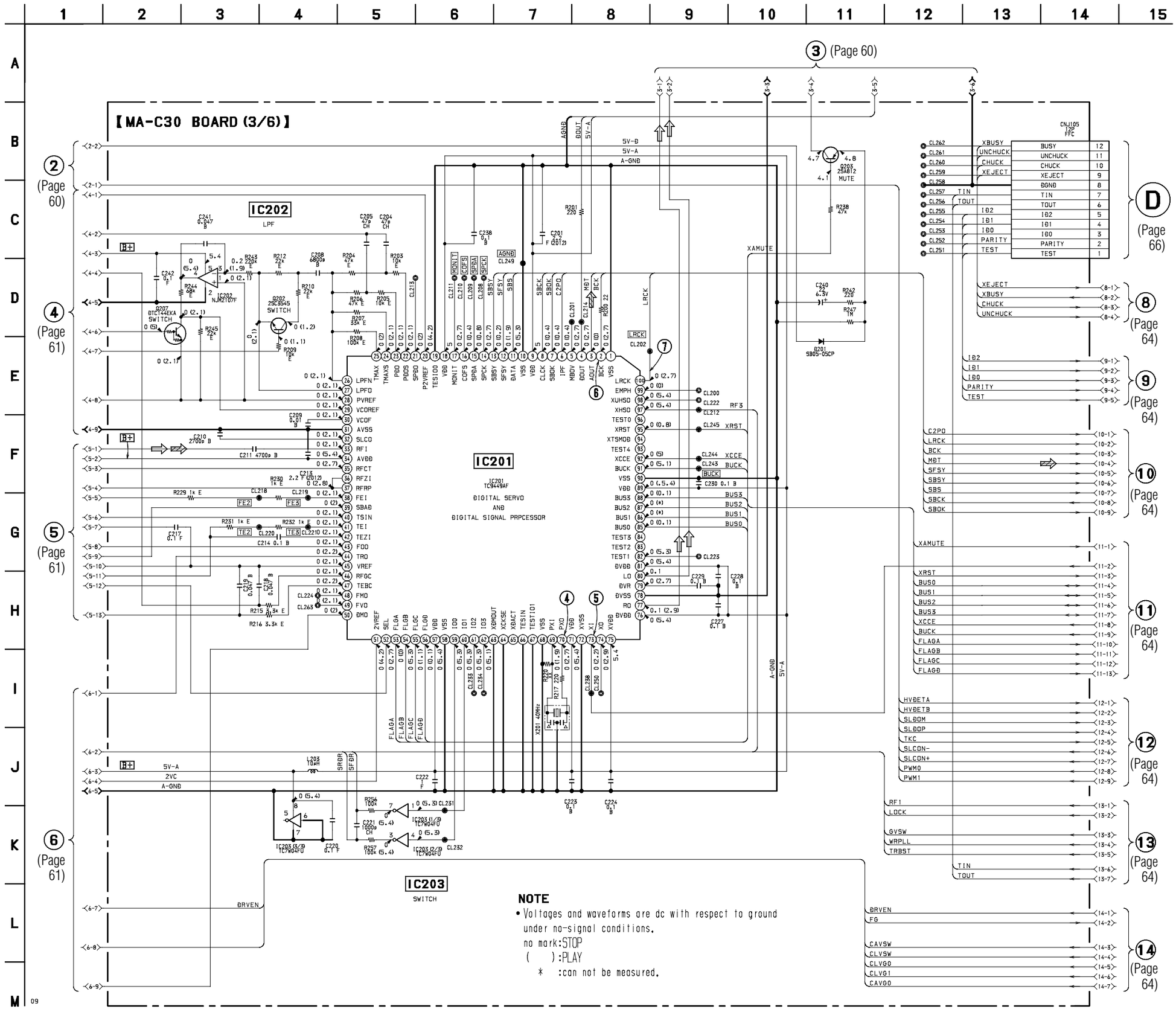
7-6. SCHEMATIC DIAGRAM – CD-ROM DRIVE (2/6) SECTION –

- **See page 57 for Waveforms.**
- **See page 76 for IC Block Diagrams.**



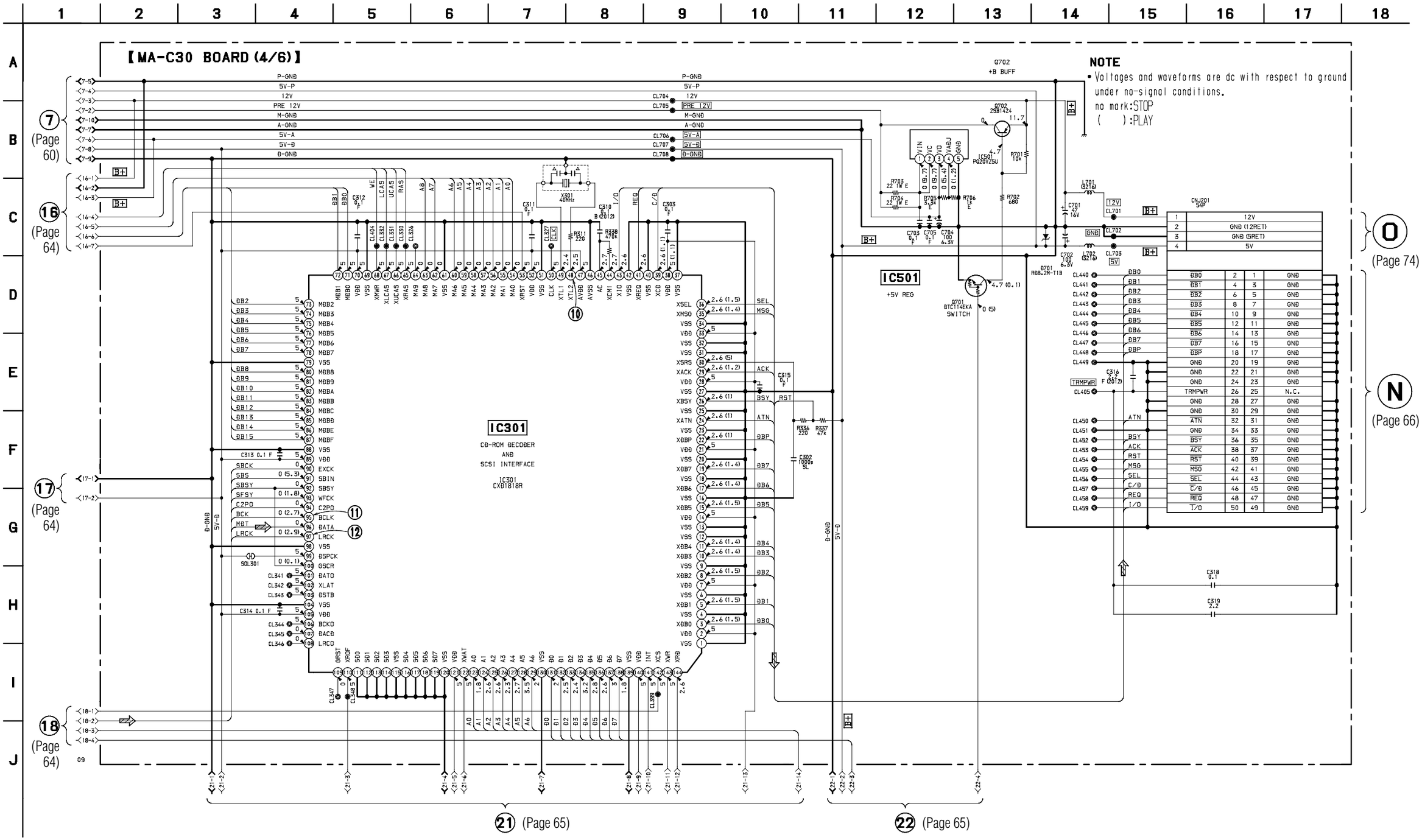
7-7. SCHEMATIC DIAGRAM – CD-ROM DRIVE (3/6) SECTION –

- See page 57 for Waveforms.
- See page 76 for IC Block Diagrams.



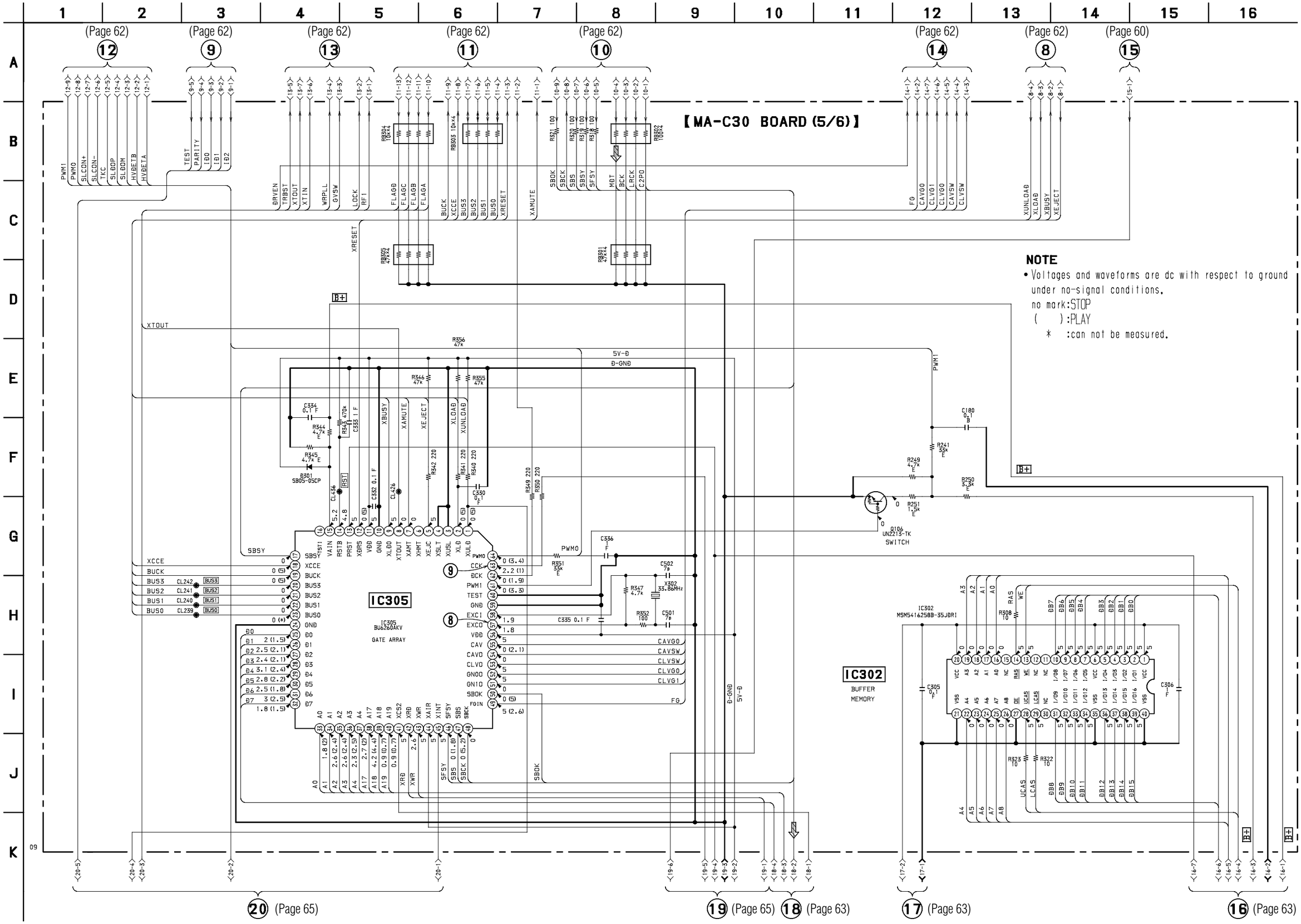
7-8. SCHEMATIC DIAGRAM – CD-ROM DRIVE (4/6) SECTION –

- **See page 57 for Waveforms.**
- **See page 78 for IC Block Diagrams.**
- **See page 83 for IC Pin Functions.**



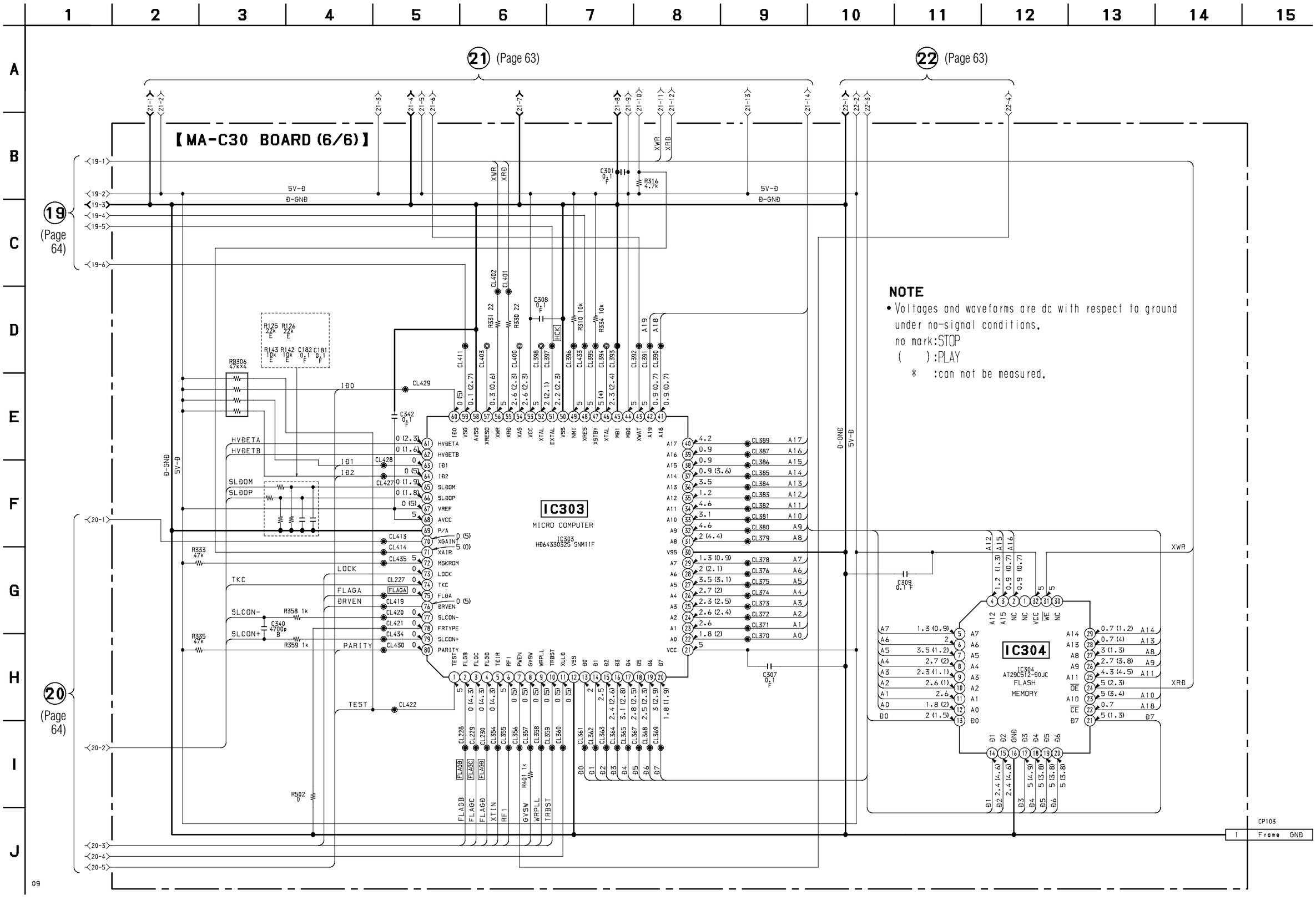
7-9. SCHEMATIC DIAGRAM – CD-ROM DRIVE (5/6) SECTION –

- See page 57 for Waveforms.
- See page 78 for IC Block Diagrams.
- See page 86 for IC Pin Functions.



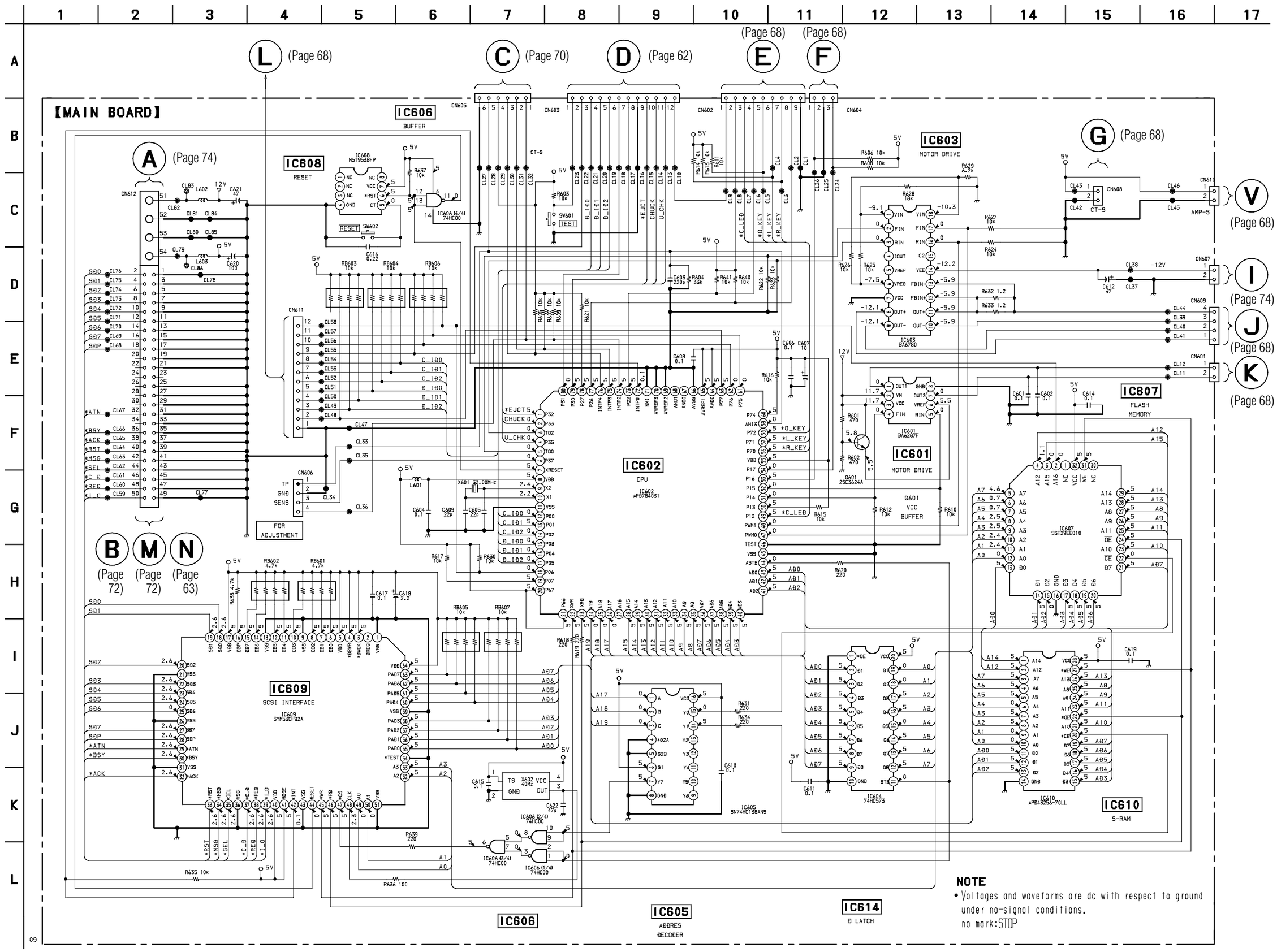
7-10. SCHEMATIC DIAGRAM – CD-ROM DRIVE (6/6) SECTION –

- **See page 57 for Waveforms.**
- **See page 79 for IC Block Diagrams.**



7-11. SCHEMATIC DIAGRAM – MAIN SECTION –

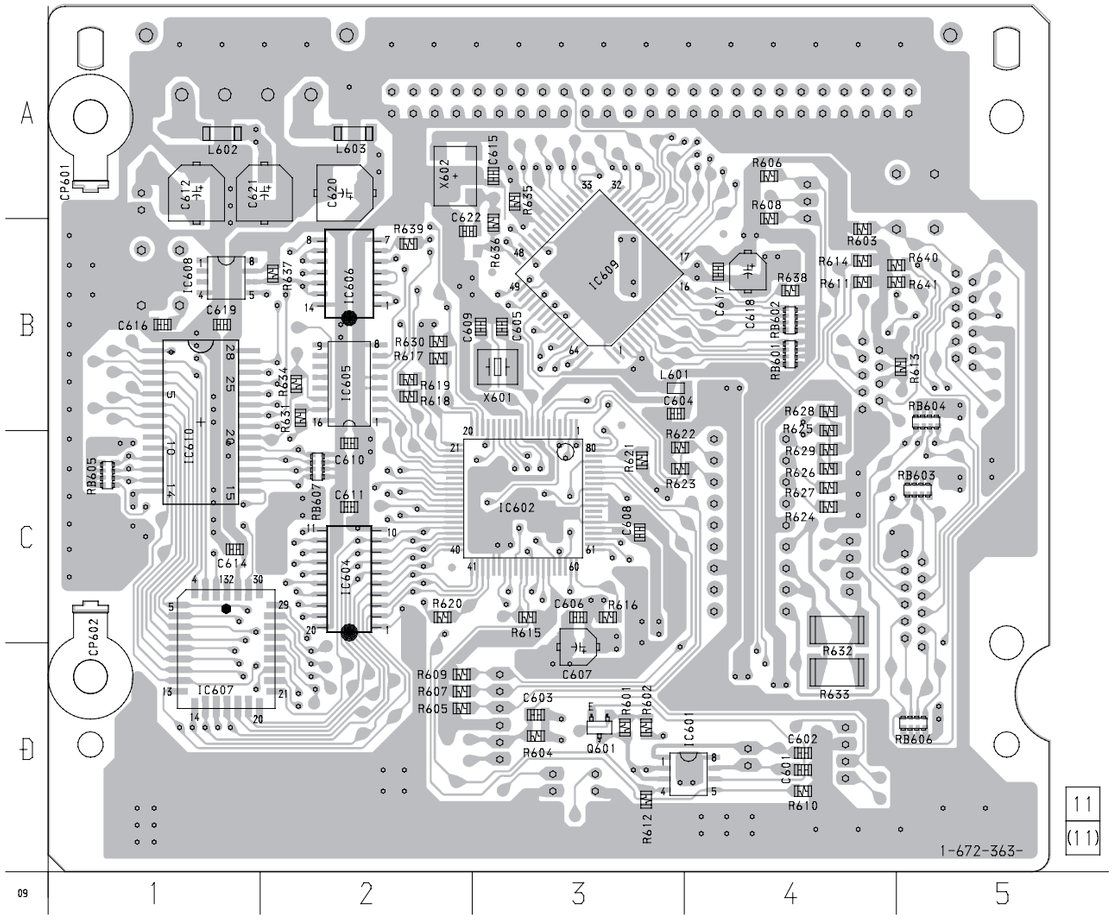
- See page 80 for IC Block Diagrams.
- See page 88 for IC Pin Functions.



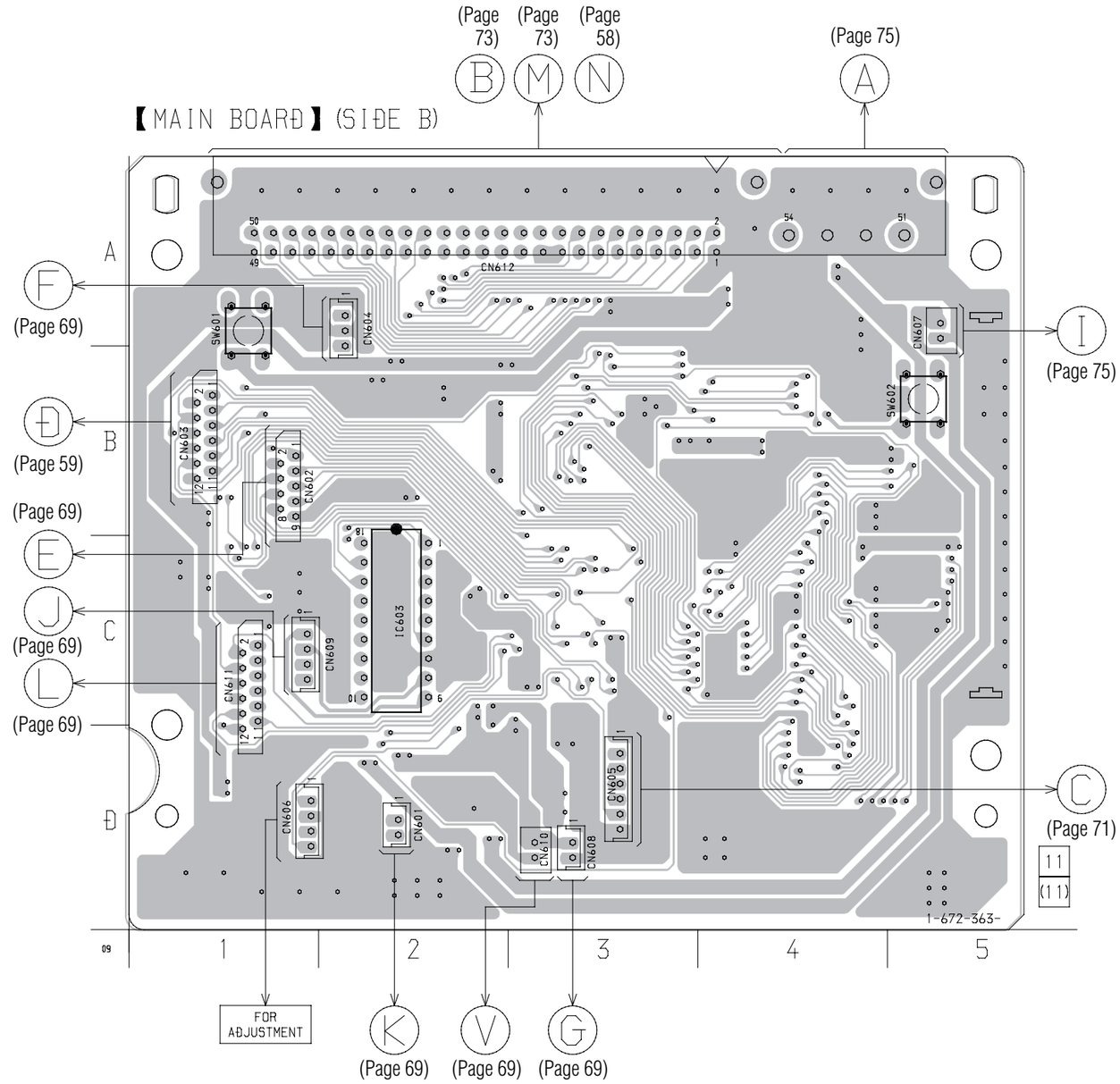
7-12. PRINTED WIRING BOARD – MAIN SECTION –

• See page 53 for Circuit Boards Location.

【MAIN BOARD】(SIDE A)



【MAIN BOARD】(SIDE B)



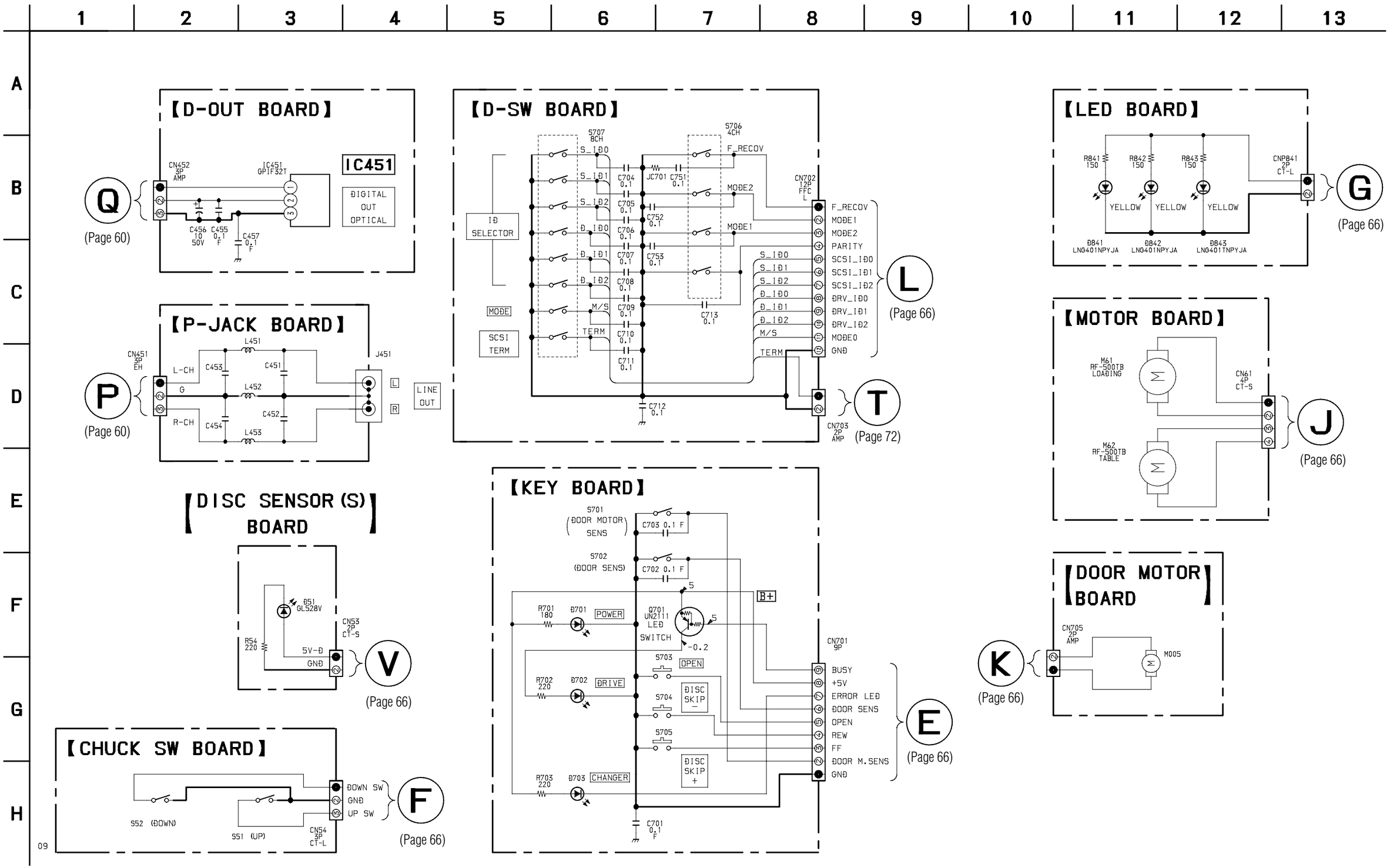
• **Semiconductor Location**

Ref. No.	Location
IC601	D-4
IC602	C-3
IC604	C-2
IC605	B-2
IC606	B-2
IC607	D-1
IC608	D-1
IC609	B-3
IC610	B-1
Q601	D-3

• **Semiconductor Location**

Ref. No.	Location
IC603	C-2

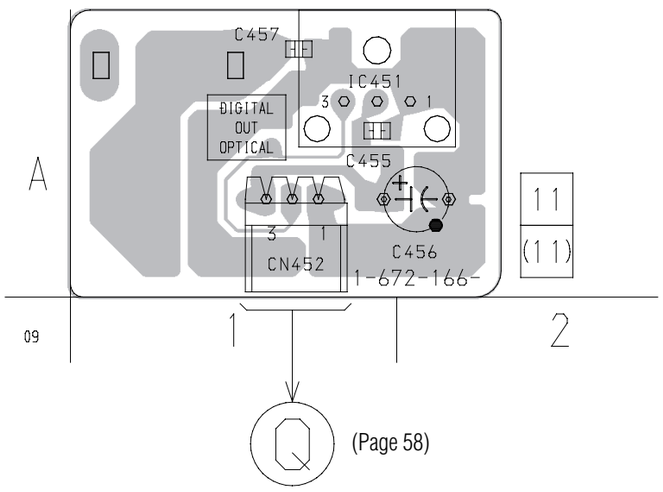
7-13. SCHEMATIC DIAGRAM – PANEL SECTION –



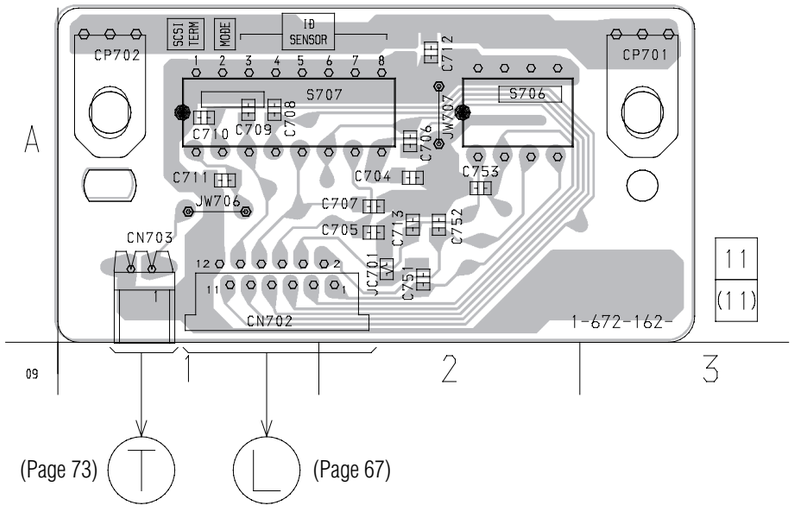
7-14. PRINTED WIRING BOARD – PANEL SECTION –

• See page 53 for Circuit Boards Location.

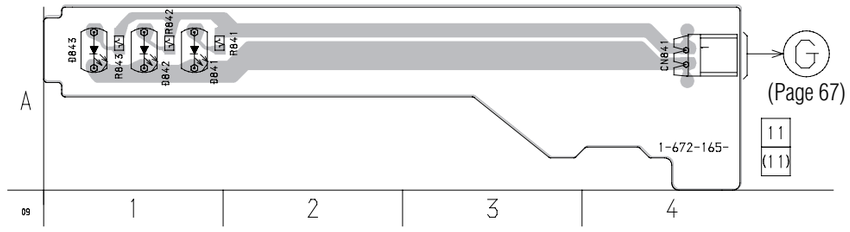
【D.OUT BOARD】



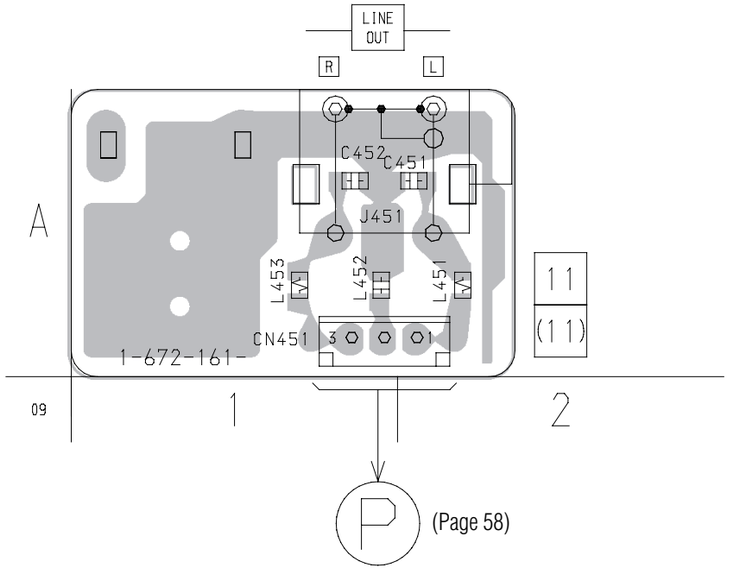
【D.SW BOARD】



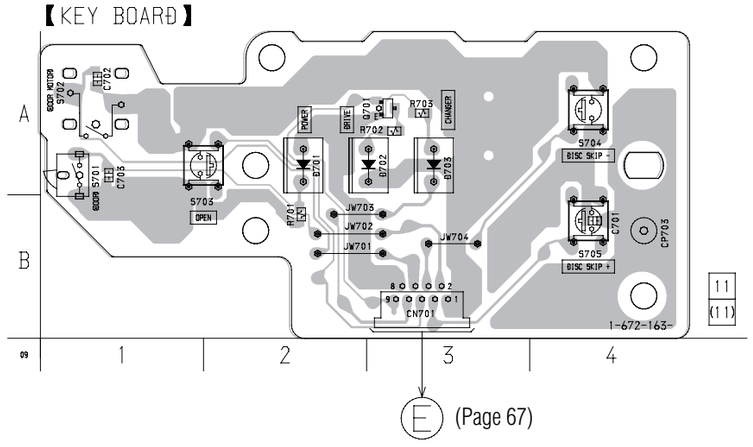
【LED BOARD】



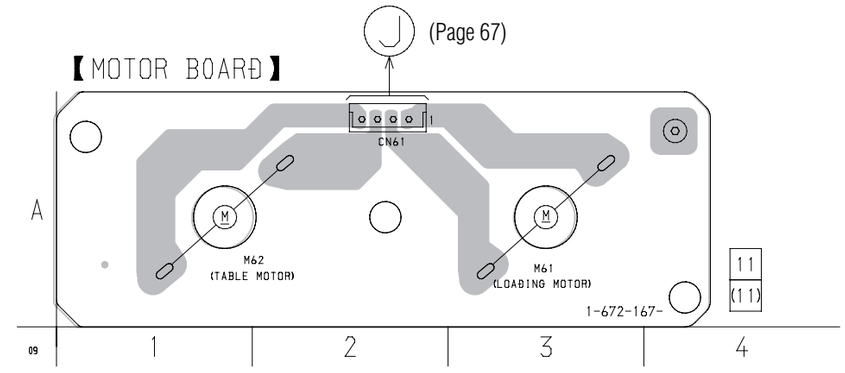
【P.JACK BOARD】



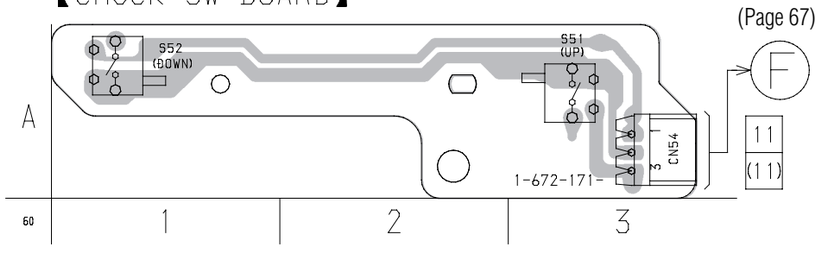
【KEY BOARD】



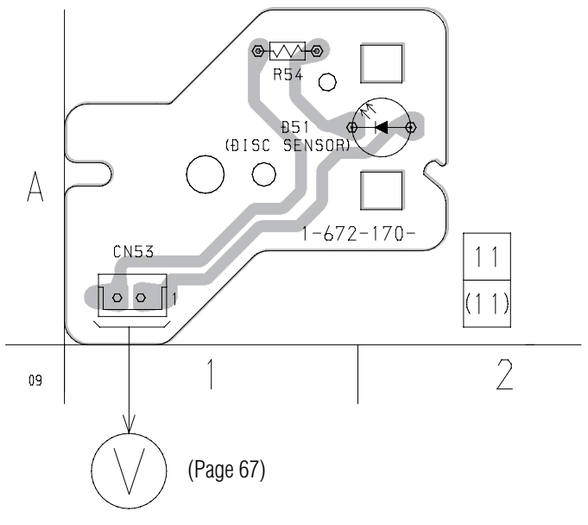
【MOTOR BOARD】



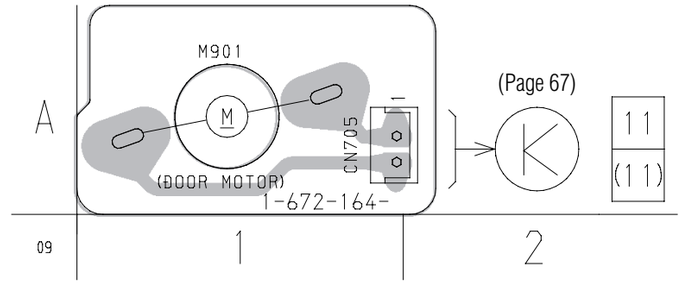
【CHUCK SW BOARD】



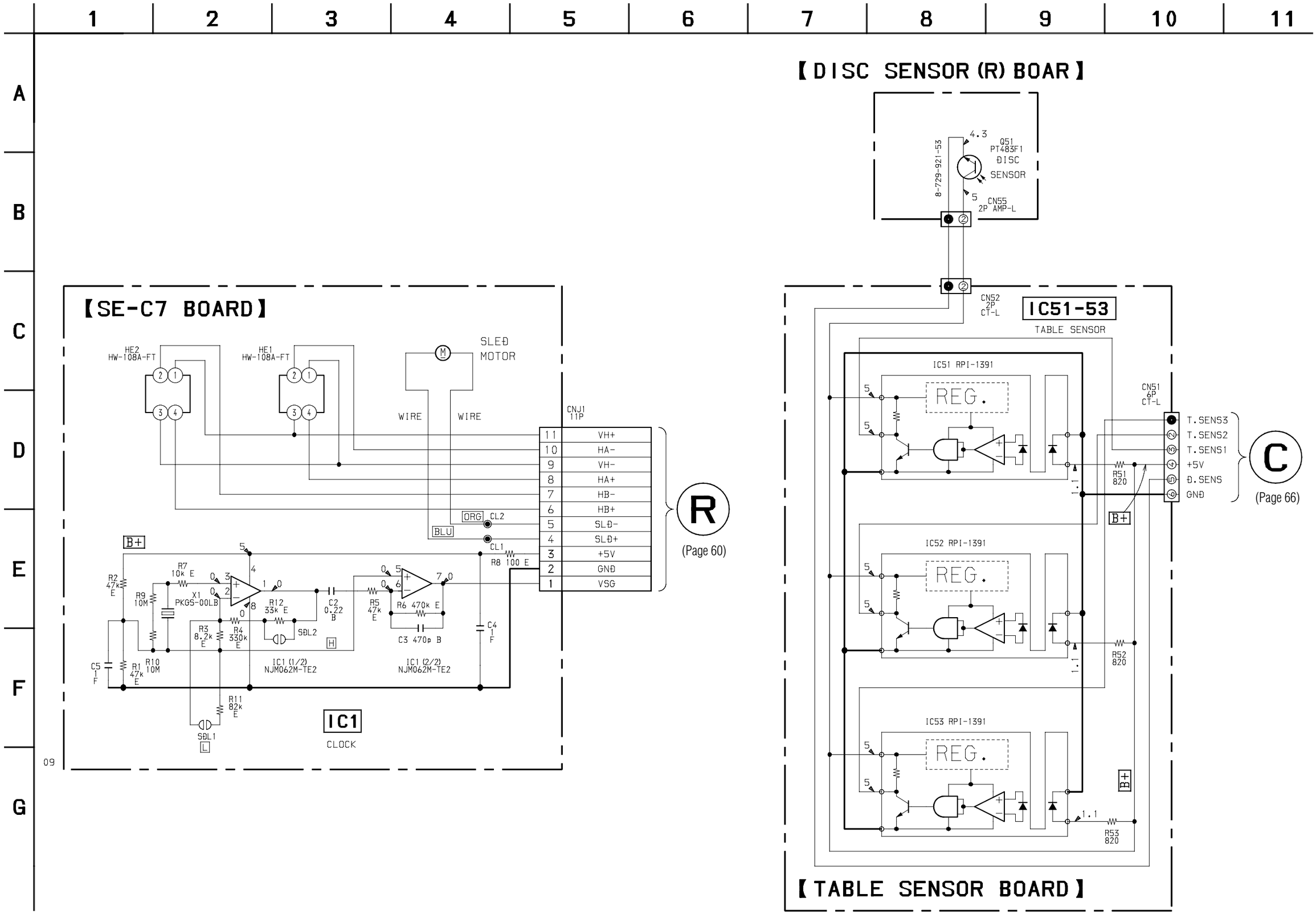
【DISC SENSOR (S) BOARD】



【DOOR MOTOR BOARD】



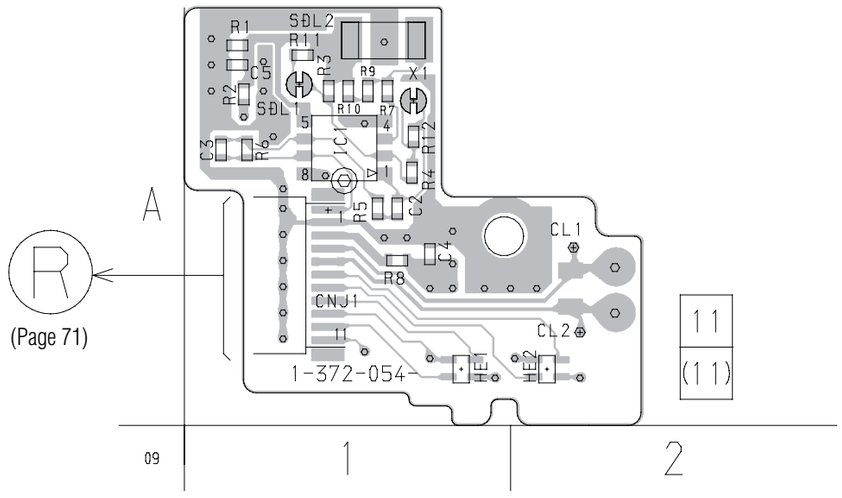
7-15. SCHEMATIC DIAGRAM – SENSOR SECTION –



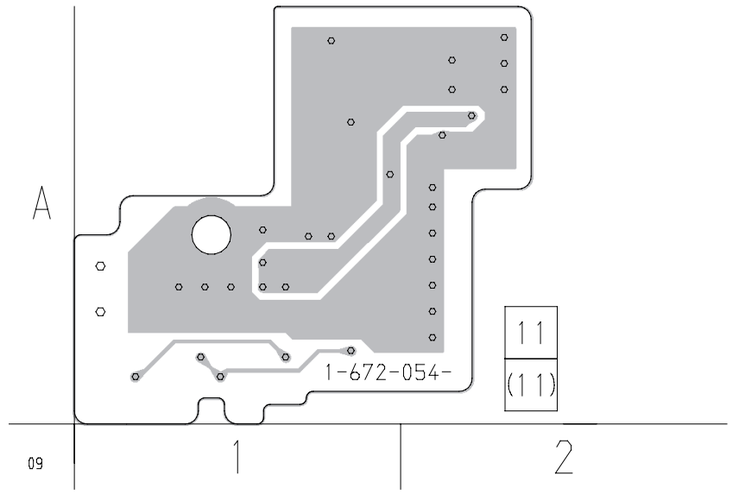
7-16. PRINTED WIRING BOARD – SENSOR SECTION –

• See page 53 for Circuit Boards Location.

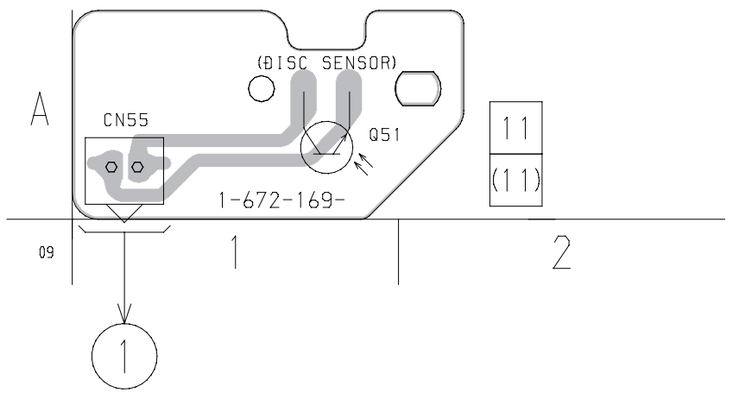
【SE-C7 BOARD】(SIDE A)



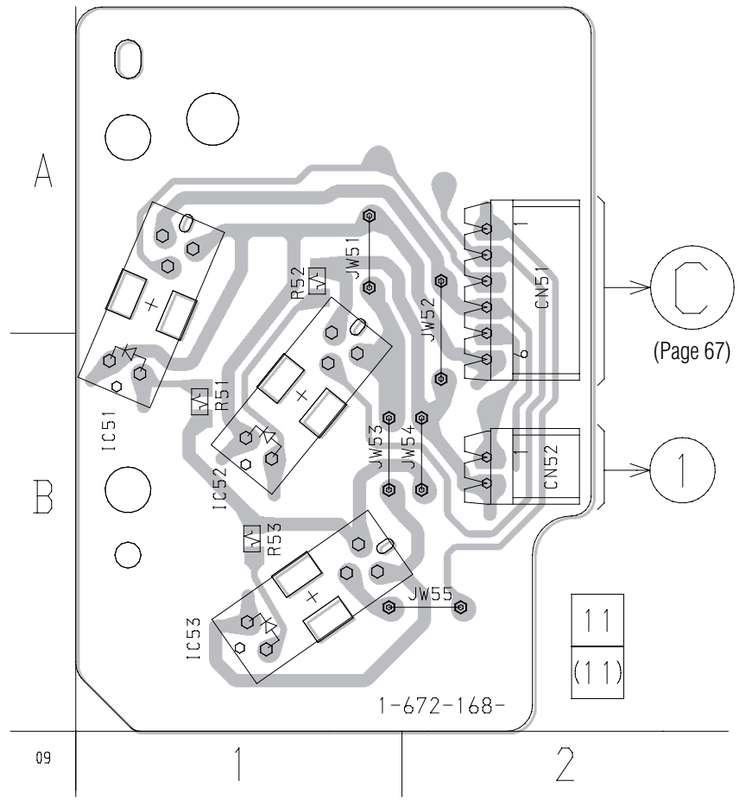
【SE-C7 BOARD】(SIDE B)



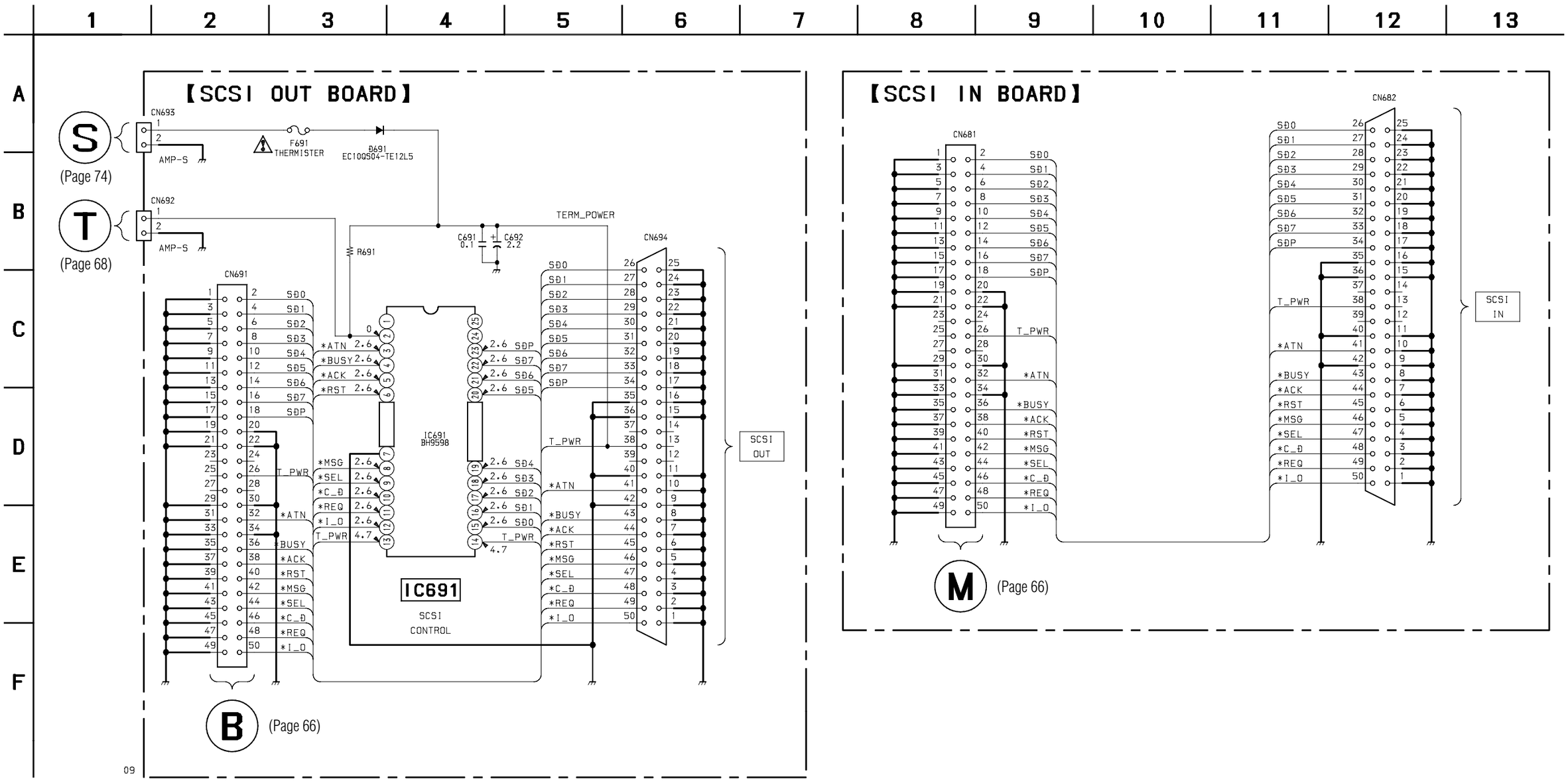
【DISC SENSOR (R) BOARD】



【TABLE SENSOR BOARD】

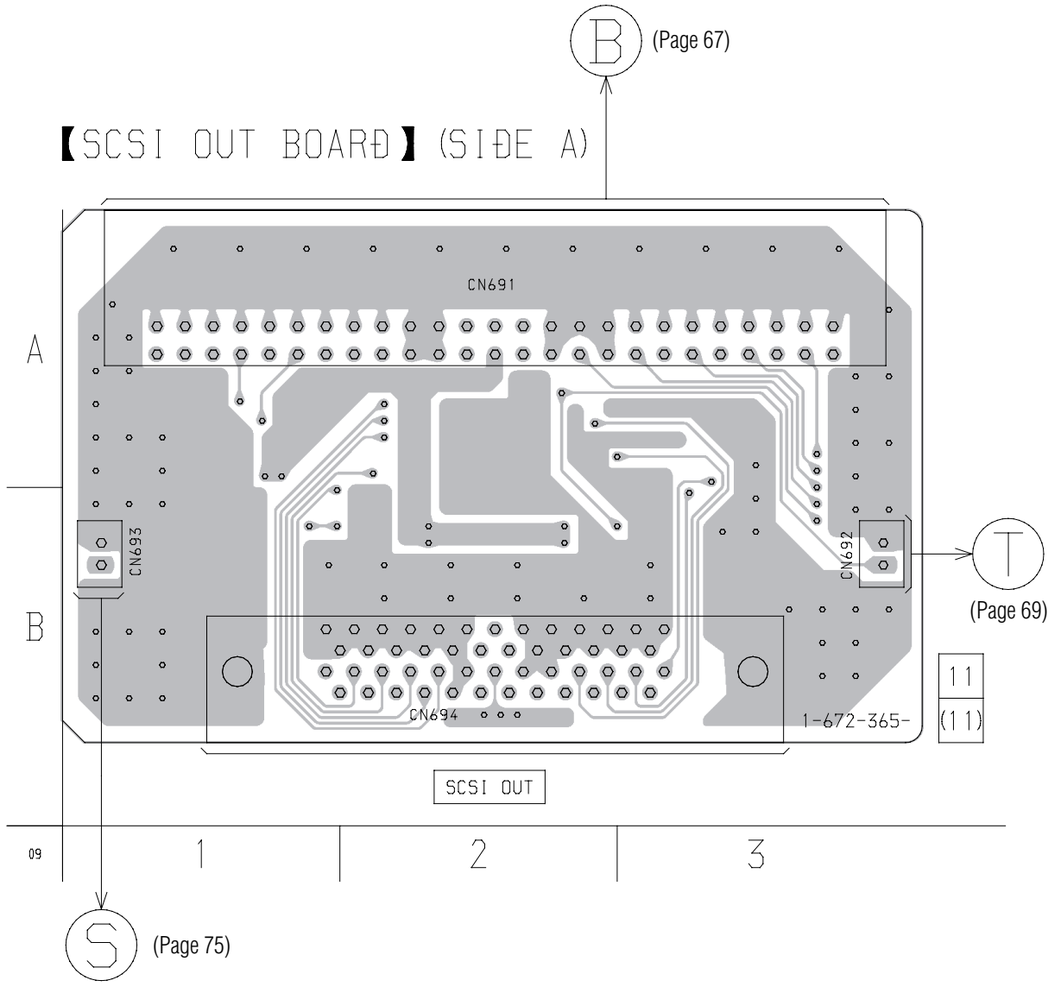


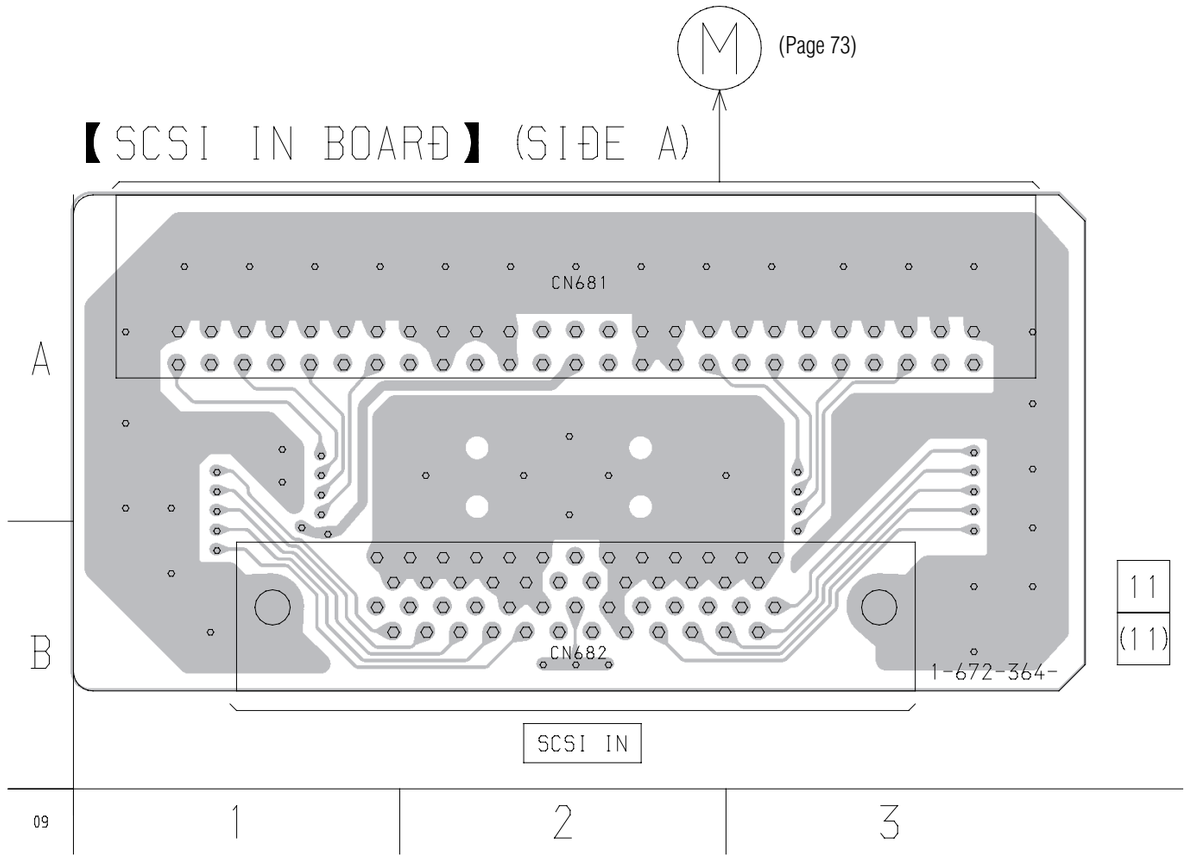
7-17. SCHEMATIC DIAGRAM – SCSI SECTION –

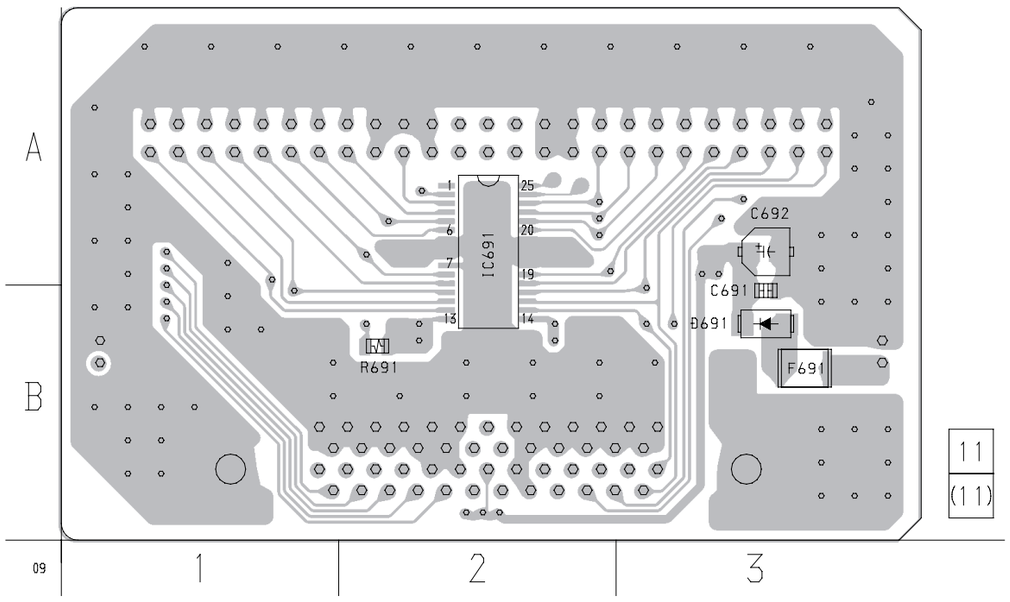


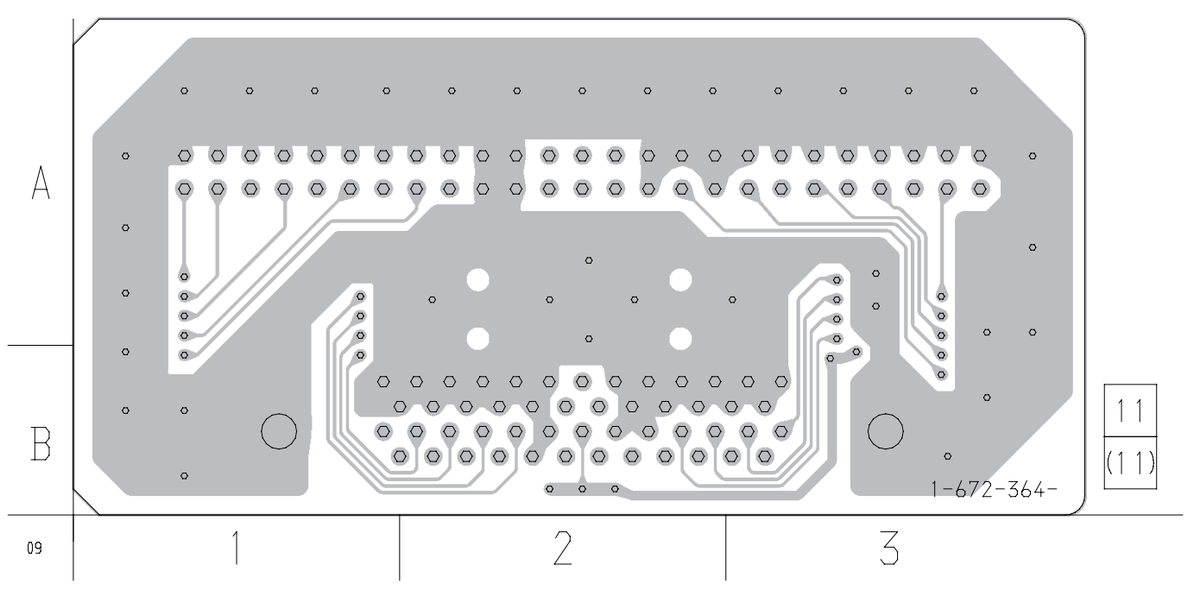
7-18. PRINTED WIRING BOARD – SCSI SECTION –

• See page 53 for Circuit Boards Location.



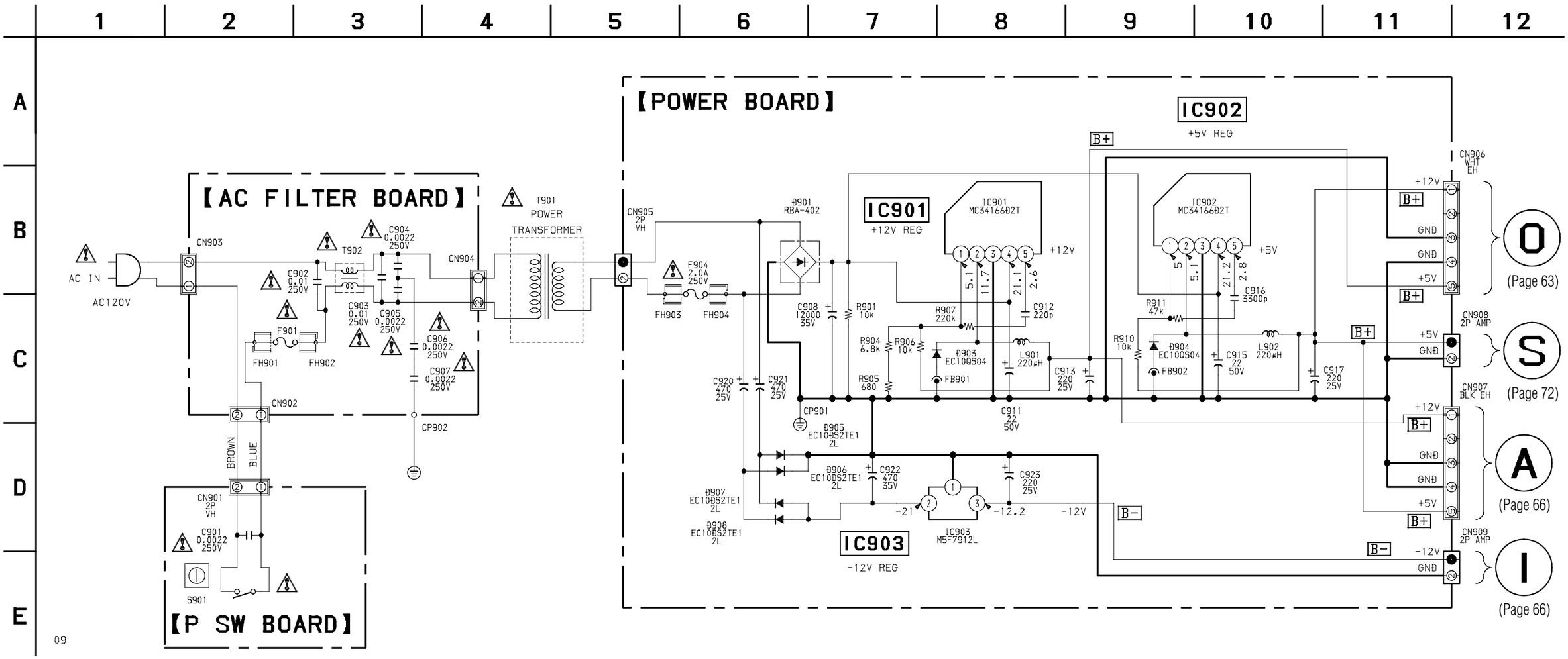






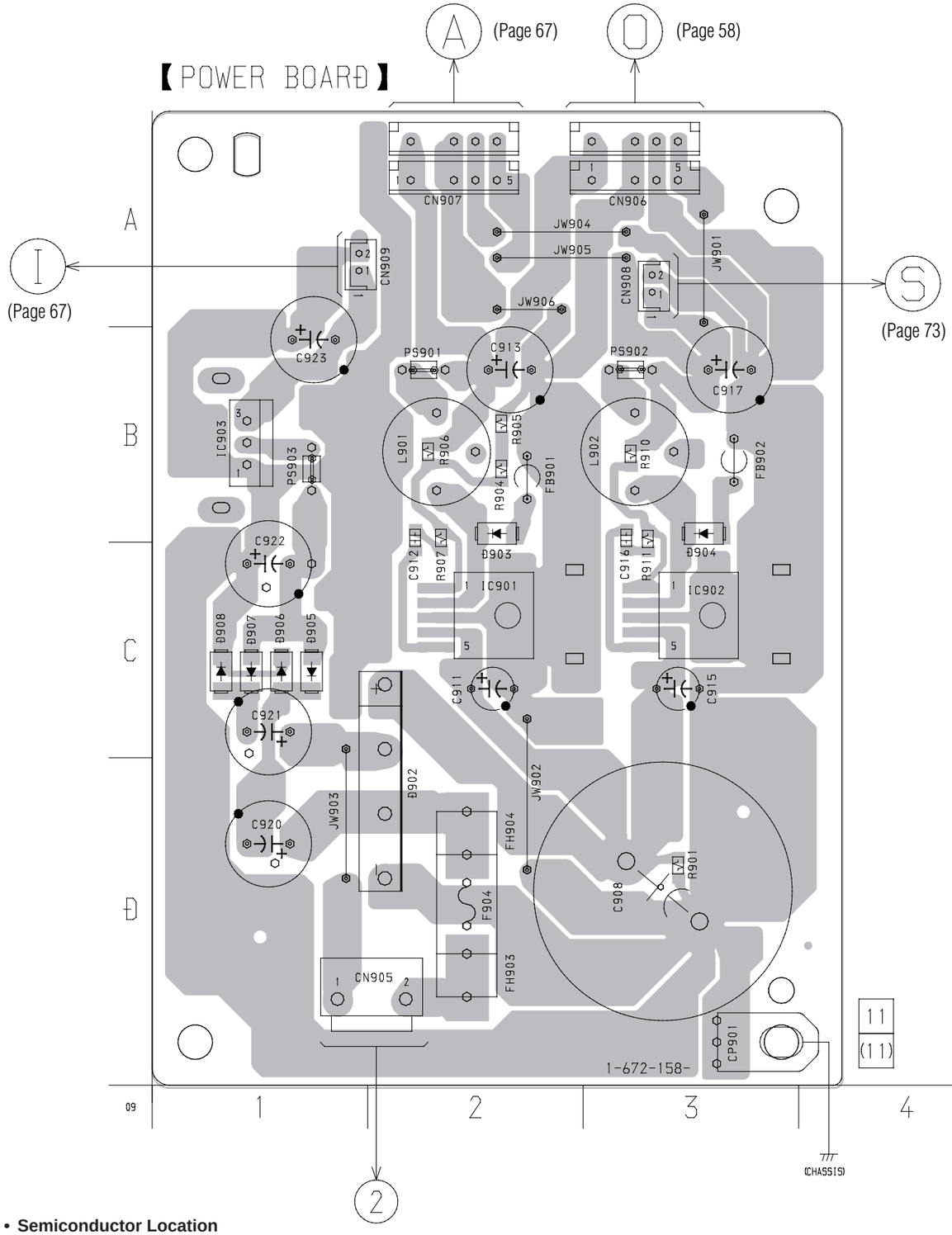
7-19. SCHEMATIC DIAGRAM – POWER SECTION –

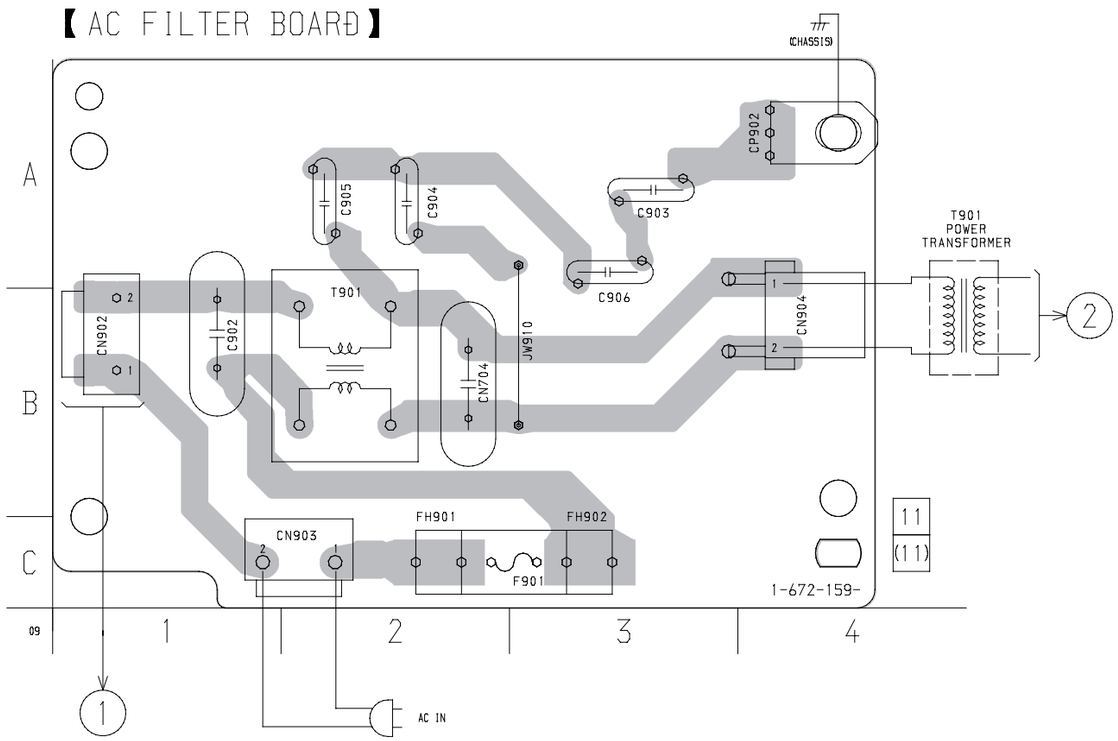
• See page 82 for IC Block Diagrams.

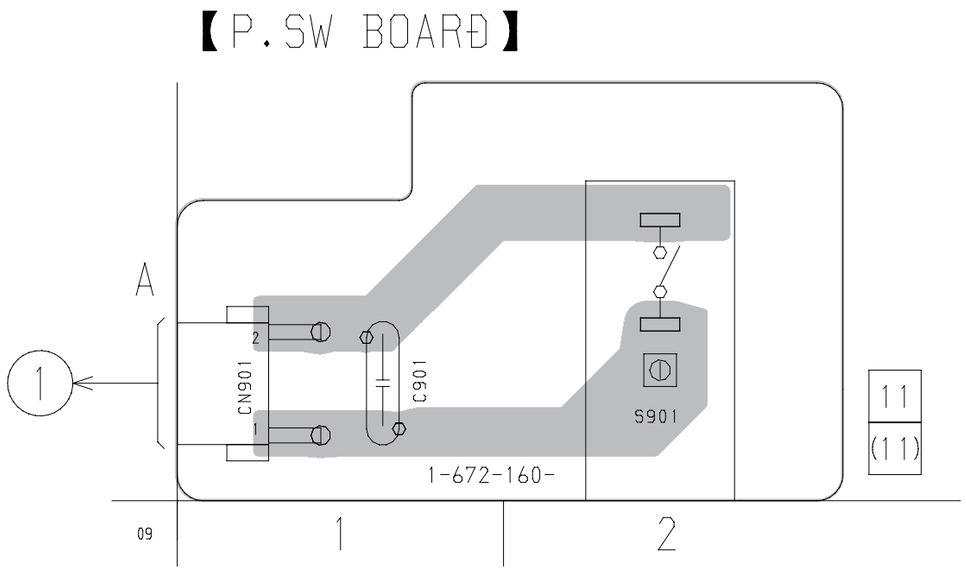


7-20. PRINTED WIRING BOARD – POWER SECTION –

• See page 53 for Circuit Boards Location.







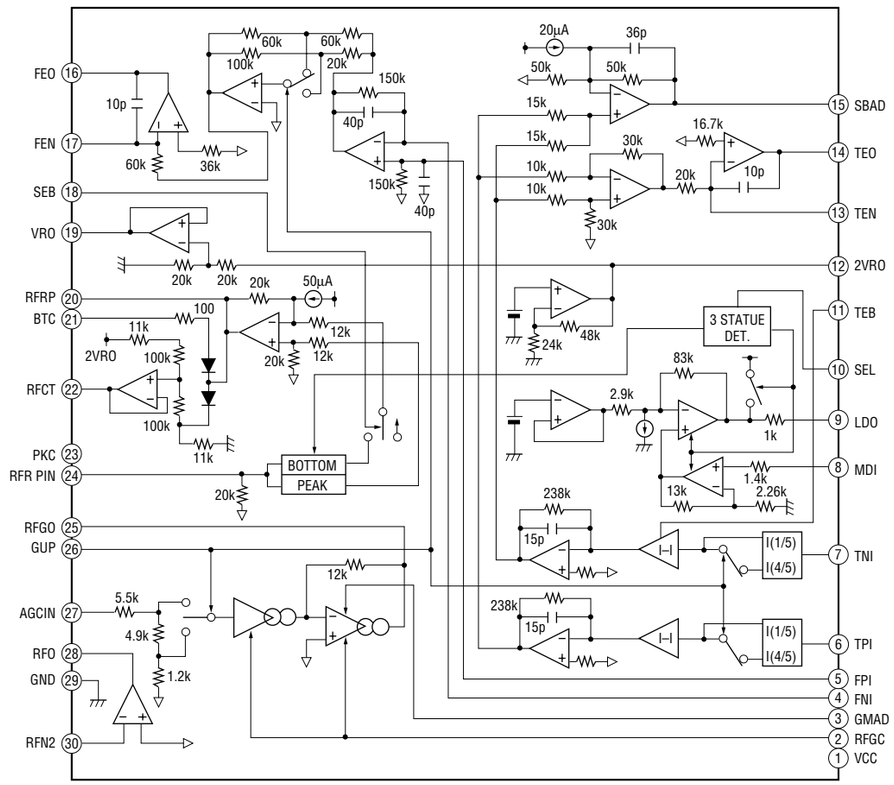
• **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D902	D-2	D908	C-1
D903	B-2		
D904	B-3	IC901	C-2
D905	C-1	IC902	C-3
D906	C-1	IC903	B-1
D907	C-1		

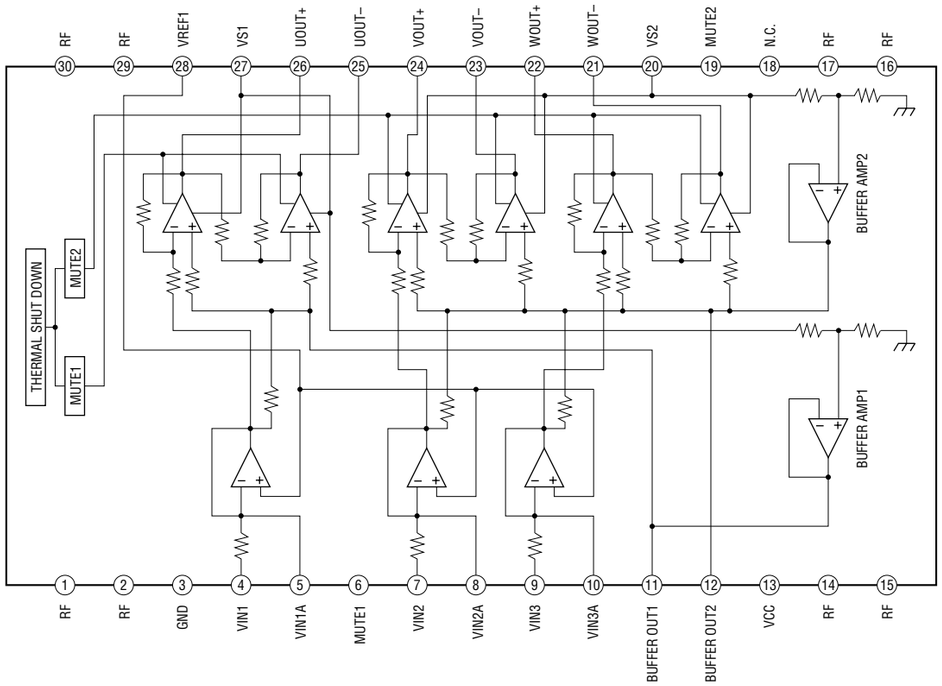
7-21. IC BLOCK DIAGRAMS

• MA-C30 Board

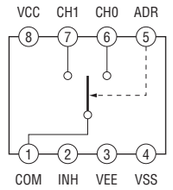
IC101 TA2112FN (EL)



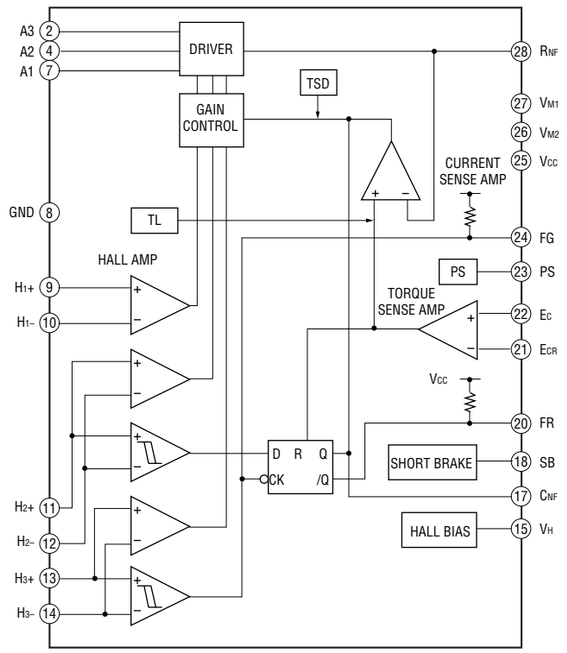
IC103 LA6539M-TE-L



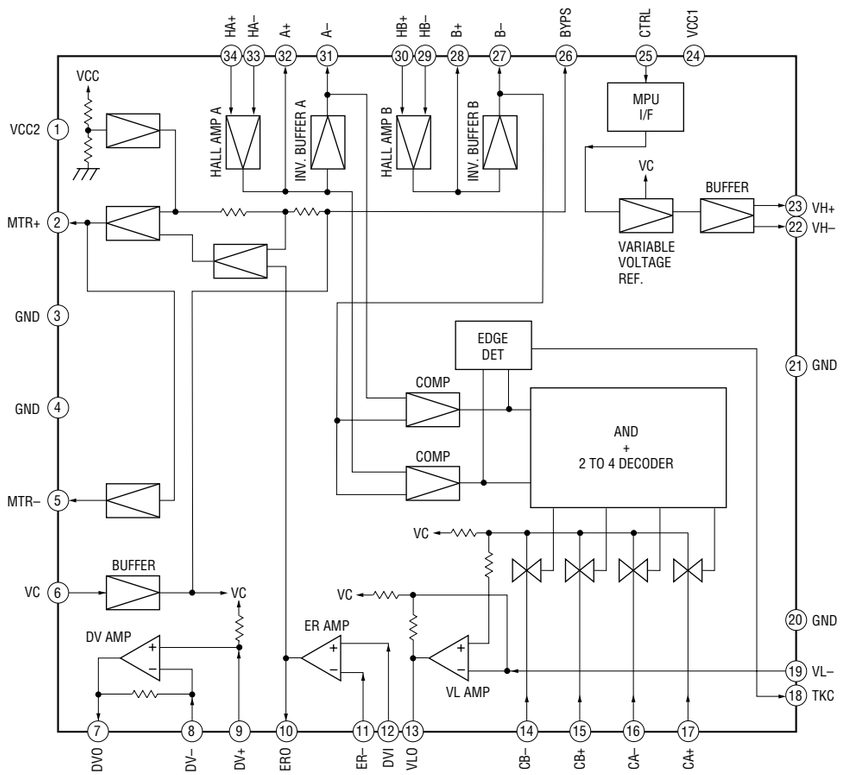
IC105 TC4W53FU



IC106 BA6849FP-E2

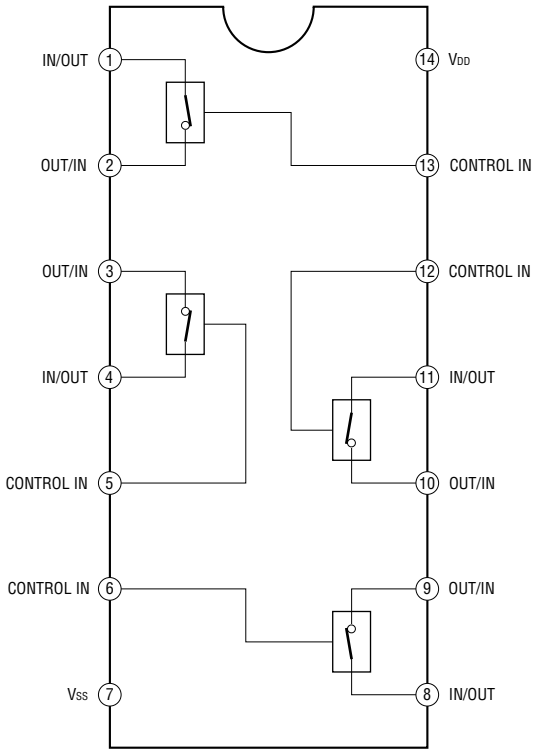


IC107 LA6527N

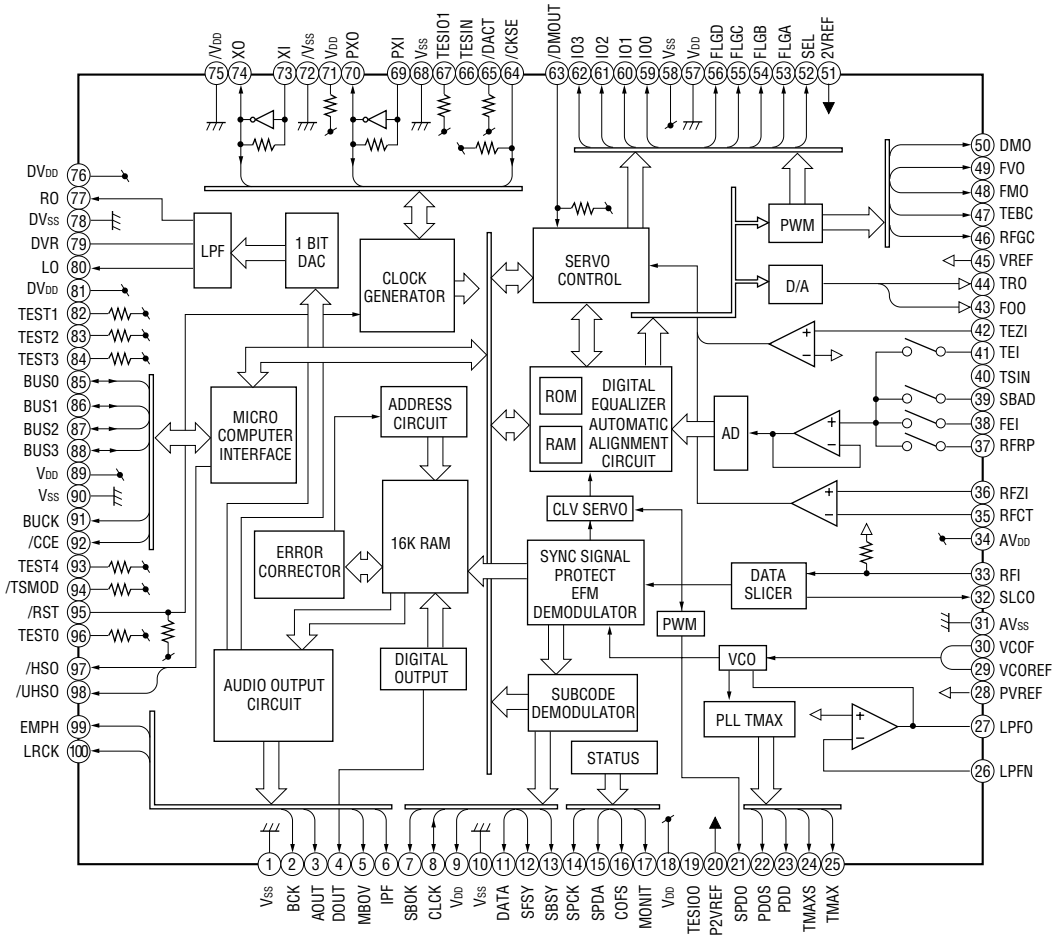


76

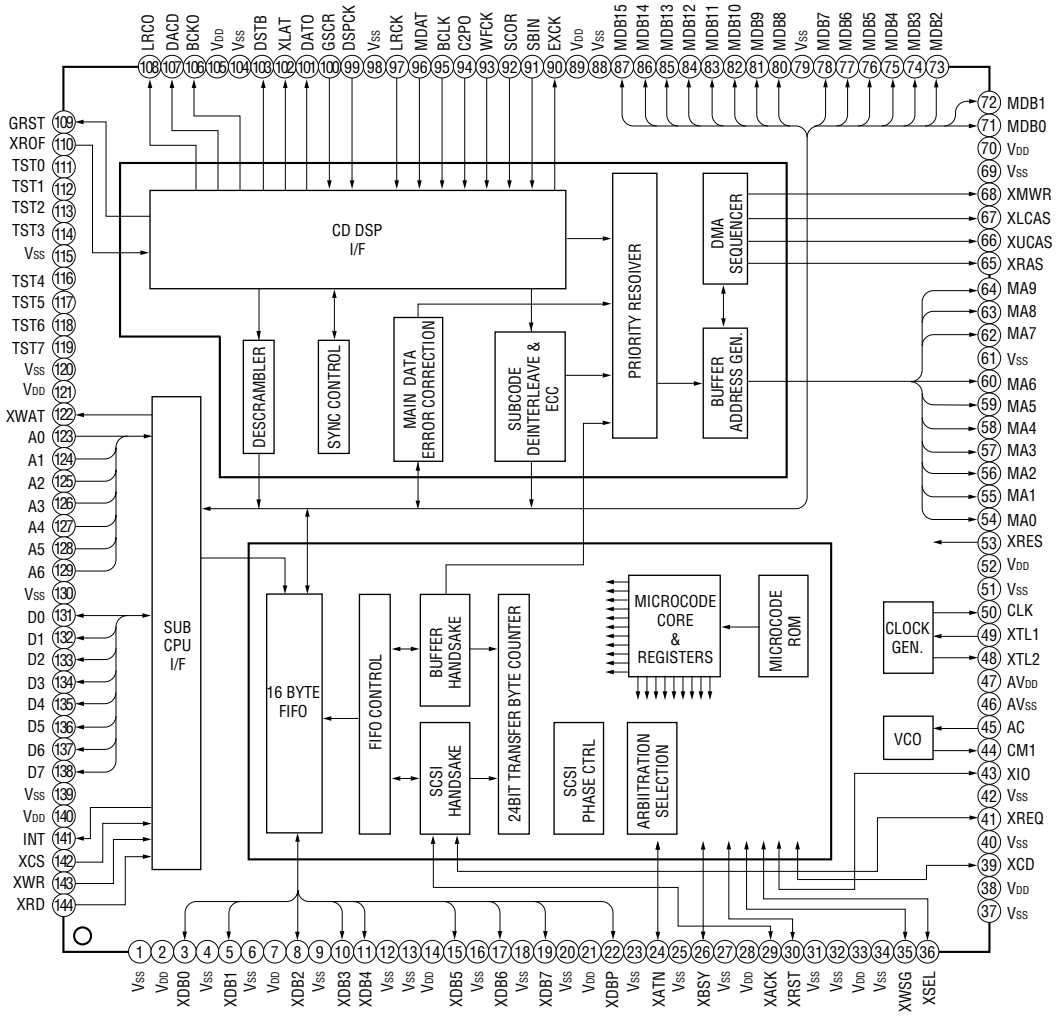
IC110 MC14066BF



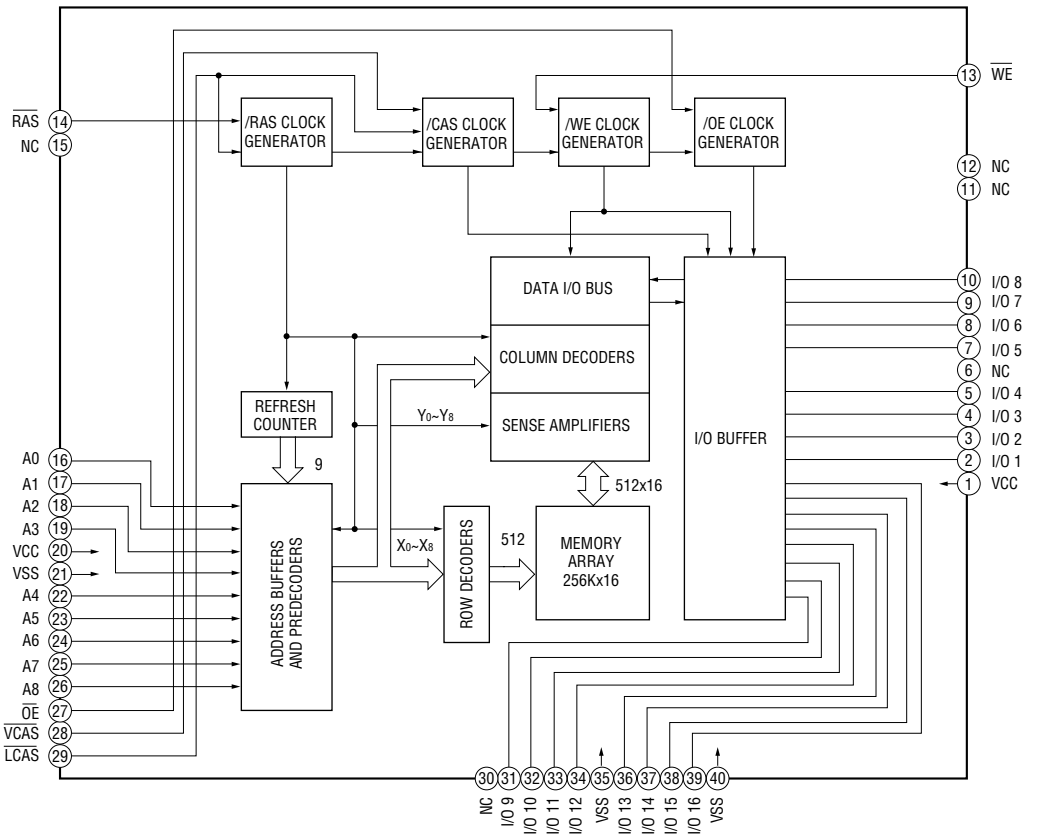
IC201 TC9449AF (BS, D, 24A)



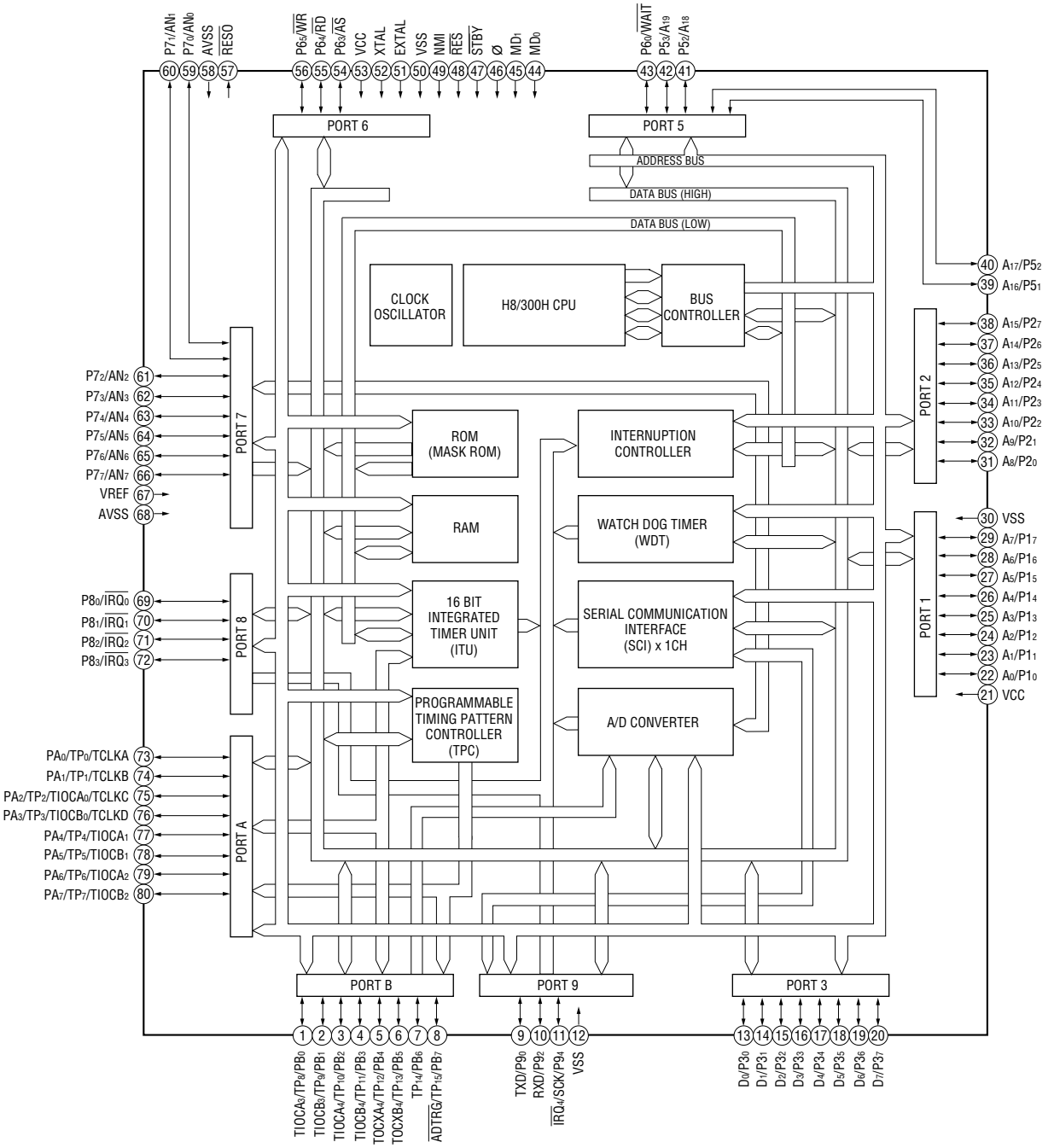
IC301 CXD1818R



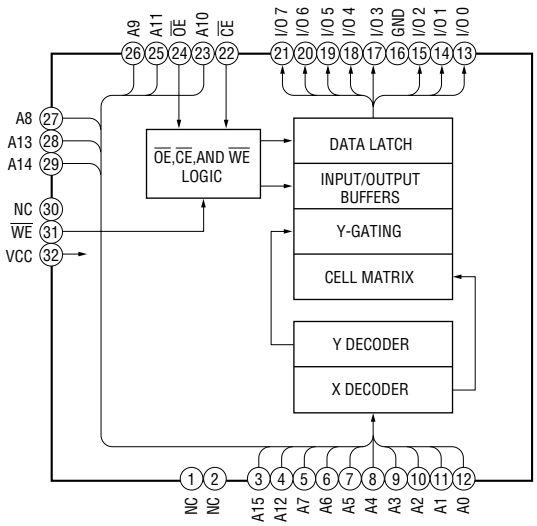
IC302 MSM5416258B-35JDR1



IC303 HD6433032SSNM11F

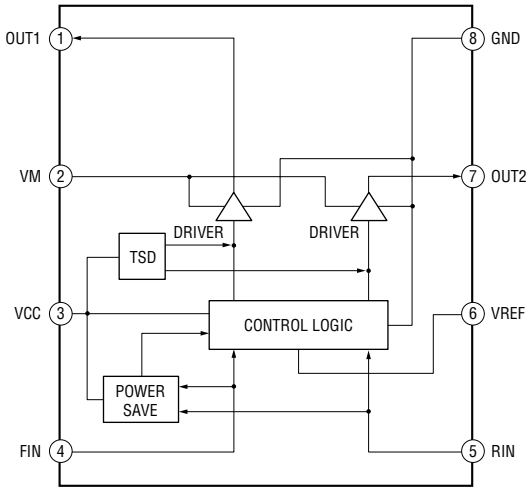


IC304 SST29EE512-90-4C-NHTR

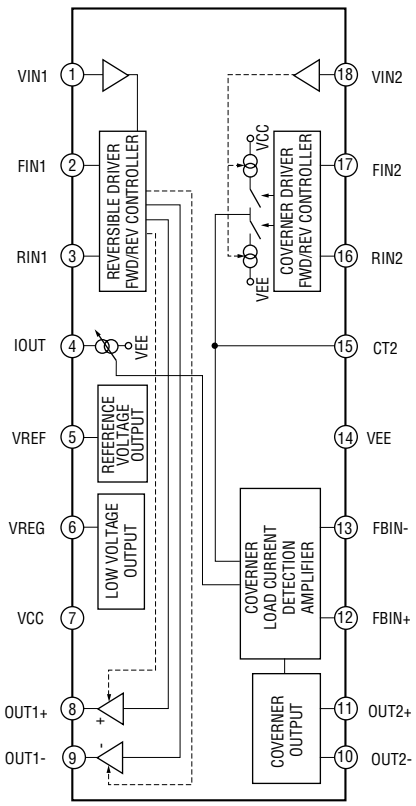


• MAIN Board

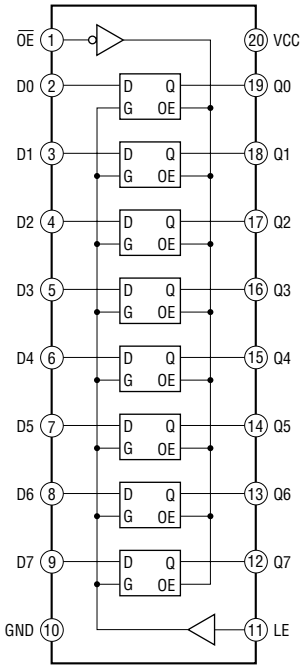
IC601 BA6287F



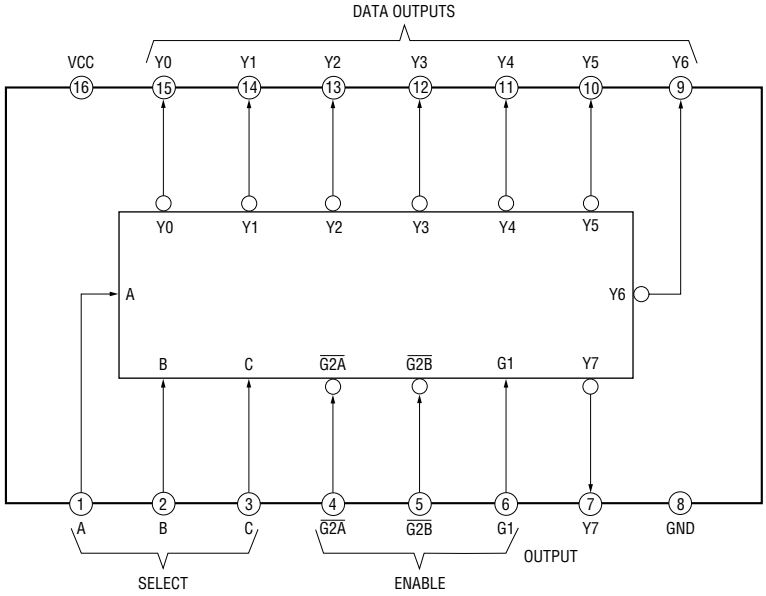
IC603 BA6780



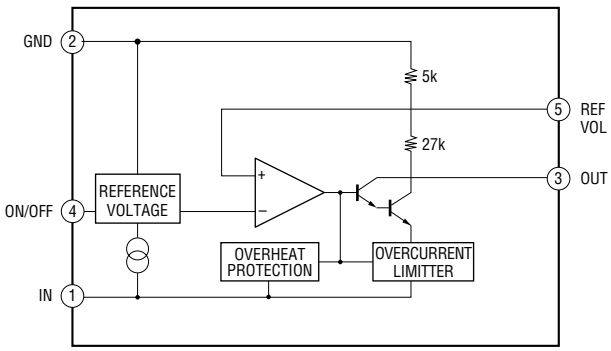
IC604 SN74HC573BNS



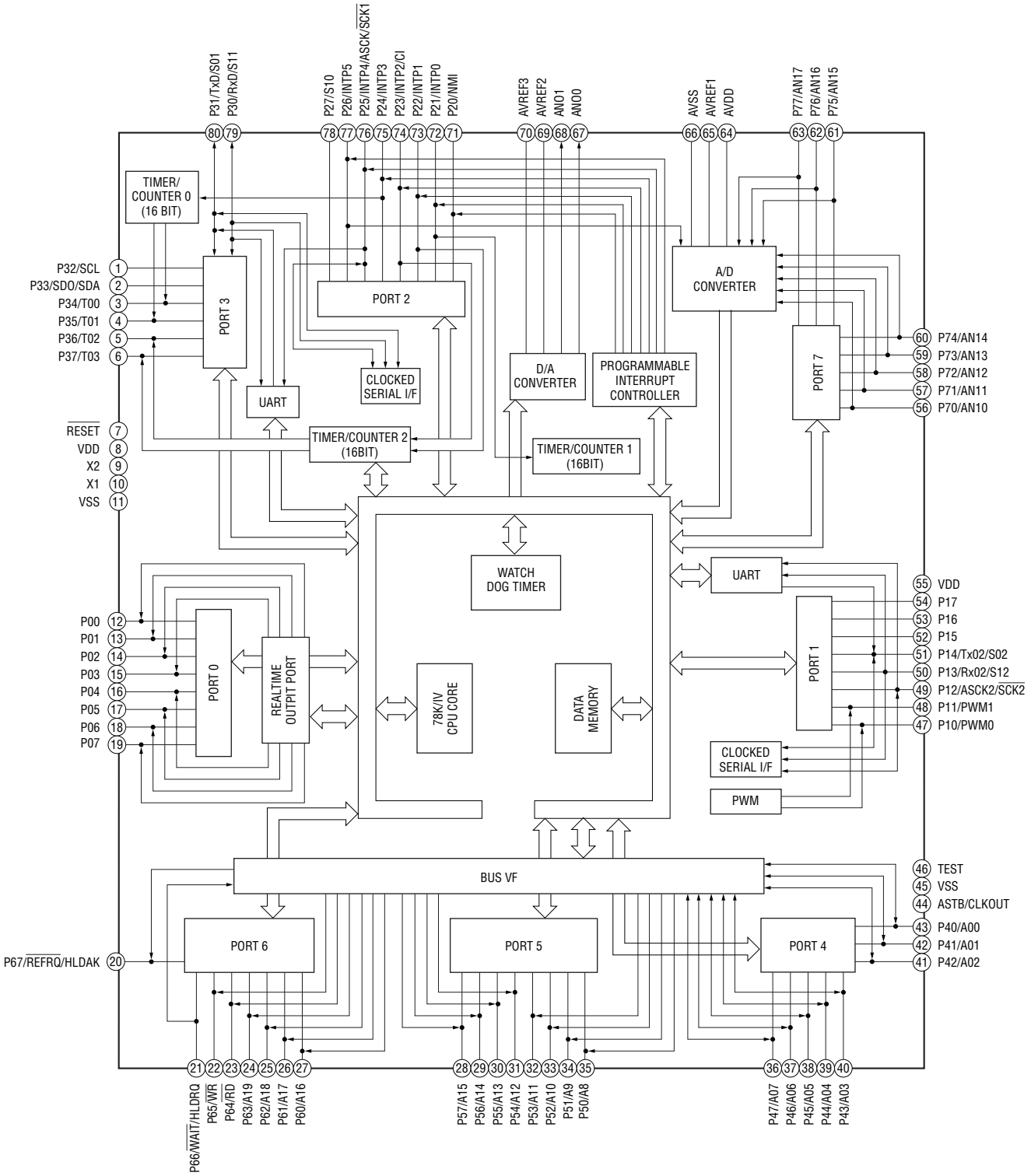
IC605 SN74HC138ANS



IC608 M51953BFP

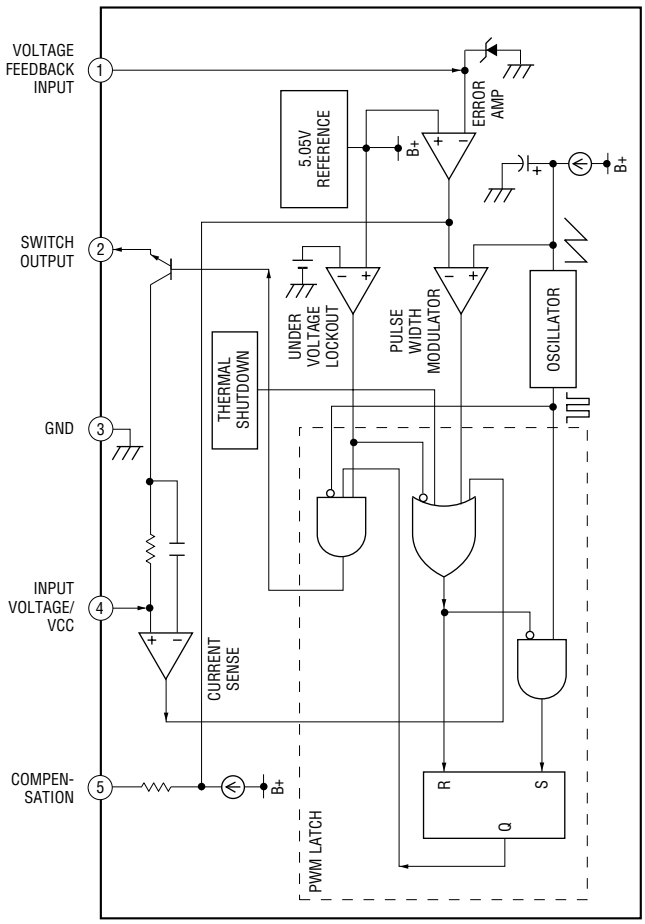


IC602 uPD784031GC-8BT



• POWER Board

IC901 MC34166D2TR4



7-22. IC PIN FUNCTIONS

• IC301 CD-ROM DECODER AND SCSI INTERFACE (CXD1818R) (MA-C30 board)

Pin No.	Pin Name	I/O	Function
1	VSS	–	Ground
2	VDD	–	Power supply (+5V)
3	XDB0	I/O	SCSI data bus bit0
4	VSS	–	Ground
5	XDB1	I/O	SCSI data bus bit1
6	VSS	–	Ground
7	VDD	–	Power supply (+5V)
8	XDB2	I/O	SCSI data bua bit2
9	VSS	–	Ground
10	XDB3	I/O	SCSI data bus bit3
11	XDB4	/O	SCSI data bus bit4
12	VSS	–	Ground
13	VSS	–	Ground
14	VDD	–	Power supply (+5V)
15	XDB5	I/O	SCSI data bus bit5
16	VSS	–	Ground
17	XDB6	I/O	SCSI data bus bit6
18	VSS	–	Ground
19	XDB7	I/O	SCSI data bus bit7
20	VSS	–	Ground
21	VDD	–	Power supply (+5V)
22	XDBP	I/O	SCSI data bus parity
23	VSS	–	Ground
24	XATN	I/O	SCSI control bus/ATN signal
25	VSS	–	Ground
26	XBSY	I/O	SCSI control bus/BSY signal
27	VSS	–	Ground
28	VDD	–	Power supply (+5V)
29	XACK	I/O	SCSI control bus/ACK signal
30	XSRS	I/O	SCSI control bus/RST signal
31	VSS	–	Ground
32	VSS	–	Ground
33	VDD	–	Power supply (+5V)
34	VSS	–	Ground
35	XMSG	I/O	SCSI control bus/MSG signal
36	XSEL	I/O	SCSI control bus/SEL signal
37	VSS	–	Ground
38	VDD	–	Power supply (+5V)
39	XCD	I/O	SCSI control bus/CD signal
40	VSS	–	Ground
41	XREQ	I/O	SCSI control bus/REQ signal
42	VSS	–	Ground
43	XIO	I/O	SCSI control bus/IO signal
44	XCM1	O	VCO charge pump output for multiplying
45	AC	I	VCO control voltage input for multiplying
46	AVSS	–	Analog ground
47	AVDD	–	Analog power supply (+5V)
48	XTL2	O	Output of crystal oscillating circuit
49	XTL1	I	Input of crystal oscillating circuit
50	CLK	O	Clock output

Pin No.	Pin Name	I/O	Function
51	VSS	–	Ground
52	VDD	–	Power supply (+5V)
53	XRES	I	CXD1804R reset signal
54	MA0	O	Address bus output bit0 to buffer memory
55	MA1	O	Address bus output bit1 to buffer memory
56	MA2	O	Address bus output bit2 to buffer memory
57	MA3	O	Address bus output bit3 to buffer memory
58	MA4	O	Address bus output bit4 to buffer memory
59	MA5	O	Address bus output bit5 to buffer memory
60	MA6	O	Address bus output bit6 to buffer memory
61	VSS	–	Ground
62	MA7	O	Address bus output bit7 to buffer memory
63	MA8	O	Address bus output bit8 to buffer memory
64	MA9	O	Address bus output bit9 to buffer memory
65	XRAS	O	Buffer memory RAS (Row Address Strobe) signal
66	XUCAS	O	Buffer memory CAS (Column Address Strobe) signal
67	XLCAS	O	Buffer memory CAS (Column Address Strobe) signal
68	XMWR	O	Buffer memory data write strobe signal
69	VSS	–	Ground
70	VDD	–	Power supply (+5V)
71	MDB0	I/O	Buffer memory data bus bit0
72	MDB1	I/O	Buffer memory data bus bit1
73	MDB2	I/O	Buffer memory data bus bit2
74	MDB3	I/O	Buffer memory data bus bit3
75	MDB4	I/O	Buffer memory data bus bit4
76	MDB5	I/O	Buffer memory data bus bit5
77	MDB6	I/O	Buffer memory data bus bit6
78	MDB7	I/O	Buffer memory data bus bit7
79	VSS	–	Ground
80	MDB8	I/O	Buffer memory data bus bit8
81	MDB9	I/O	Buffer memory data bus bit9
82	MDBA	I/O	Buffer memory data bus bit10
83	MDBB	I/O	Buffer memory data bus bit11
84	MDBC	I/O	Buffer memory data bus bit12
85	MDBD	I/O	Buffer memory data bus bit13
86	MDBE	I/O	Buffer memory data bus bit14
87	MDBF	I/O	Buffer memory data bus bit15
88	VSS	–	Ground
89	VDD	–	Power supply (+5V)
90	EXCK	O	SBIN reading clock (Connected to CXD3000 EXCK pin/pin 65)
91	SBIN	I	Subcode serial signal (Connected to CXD3000 SBSO pin/pin 64)
92	SBSY	I	Subcode sync signal (Connected to CXD3000 SBSY pin/pin 63)
93	WFCK	I	Write frame clock (Connected to CXD3000 WFCK pin/pin 62)
94	C2P0	I	C2 pointer signal, indicating an error in MDAT.
95	BCLK	I	Bit clock, MDAT strobe signal
96	DATA	I	Serial data stream from DSP for CD
97	LRCK	I	LR signal, indicating Lch and Rch of MDAT.
98	VSS	–	Ground
99	DSPCK	I	Enter DSP clock
100	GSCR	I	SCOR syncronizing with DSP data output (Connected to CXD3000 GRSCOR pin/pin 113)

Pin No.	Pin Name	I/O	Function
101	DATO	O	Serial data output from sub CPU to CD DSP
102	XLAT	O	DAT0 latch signal. Latch at leading edge
103	DSTB	O	DAT0 transfer clock
104	VSS	–	Ground
105	VDD	–	Power supply (+5V)
106	BCKO	O	Bit clock (Connected to CXD3000 BCKI pin/pin 30)
107	DACD	O	Audio data output to DAC (Connected to CXD3000 PCMDI pin/pin 28)
108	LRCO	O	LR clock output to DAC (Connected to CXD3000 LRCKI pin/pin 26)
109	GRST	O	Output for GRSCOR resyncronizing (Connected to CXD3000 SCSY pin/pin 68)
110	XROF	I	DSP RAM Overflow input (Connected to CXD3000/ROF pin/pin 45)
111	SD0	I	Test pin0
112	SD1	I	Test pin1
113	SD2	I	Test pin2
114	SD3	I	Test pin3
115	VSS	–	Ground
116	SD4	I	Test pin4
117	SD5	I	Test pin5
118	SD6	I	Test pin6
119	SD7	I	Test pin7
120	VSS	–	Ground
121	VDD	–	Power supply (+5V)
122	XWAT	O	Wait signal for sub CPU buffer memory access
123	A0	I	CXD1804R built-in register address bus0
124	A1	I	CXD1804R built-in register address bus1
125	A2	I	CXD1804R built-in register address bus2
126	A3	I	CXD1804R built-in register address bus3
127	A4	I	CXD1804R built-in register address bus4
128	A5	I	CXD1804R built-in register address bus5
129	A6	I	CXD1804R built-in register address bus6
130	VSS	–	Ground
131	D0	I/O	Sub CPU data bus0
132	D1	I/O	Sub CPU data bus1
133	D2	I/O	Sub CPU data bus2
134	D3	I/O	Sub CPU data bus3
135	D4	I/O	Sub CPU data bus4
136	D5	I/O	Sub CPU data bus5
137	D6	I/O	Sub CPU data bus6
138	D7	I/O	Sub CPU data bus7
139	VSS	–	Ground
140	VDD	–	Power supply (+5V)
141	INT	O	Interruption to sub CPU
142	XCS	I	CXD1804R chip select signal
143	XWR	I	CXD1804R built-in register write signal
144	XRD	I	CXD1804R built-in register read signal

• **IC305 GATA ARRAY (BU6260AKV) (MA-C30 board)**

Pin No.	Pin Name	I/O	Function
1	XULD	I	Switch
2	XLD	I	Switch
3	XUSL	I	Ground
4	XSLT	I	Ground
5	XEJC	I	Switch
6	XHMT	O	Headphone mute
7	XAMT	O	Audio mute
8	XTOUT	O	LED
9	XLDO	O	LED
10	GND	–	Ground
11	VDD	–	Power supply
12	XDRS	O	DSP reset
13	PRST	O	CPU/Monet reset
14	RSTB	I/O	Reset
15	VAIN	I	Reset
16	TST1	I	Not used
17	SBSY	I	DSP subcode sync
18	XCCE	O	DSP
19	BUCK	O	DSP
20	BUS3	I/O	DSP
21	BUS2	I/O	DSP
22	BUS1	I/O	DSP
23	BUS0	I/O	DSP
24	GND	–	Ground
25	D0	I/O	CPU data bus
26	D1	I/O	CPU data bus
27	D2	I/O	CPU data bus
28	D3	I/O	CPU data bus
29	D4	I/O	CPU data bus
30	D5	I/O	CPU data bus
31	D6	I/O	CPU data bus
32	D7	I/O	CPU data bus
33	A0	I	CPU address bus
34	A1	I	CPU address bus
35	A2	I	CPU address bus
36	A3	I	CPU address bus
37	A4	I	CPU address bus
38	A17	I	CPU address bus
39	A18	I	CPU address bus
40	A19	I	CPU address bus
41	XCS2	O	Monet chip enable
42	XRD	I	CPU read strobe
43	XWR	I	CPU write strobe
44	XAIR	I	Power supply
45	XINT	O	CPU interrupt
46	SFSY	I	DSP
47	SBS	I	DSP
48	SBCK	I	DSP
49	FGIN	I	Spindle driver
50	SBOK	I	DSP

Pin No.	Pin Name	I/O	Function
51	GN1 O	O	Spindle driver 1 on
52	GN0 O	O	Spindle driver 0 on
53	CLV0	O	CLV on
54	CAV0	O	CAV on
55	CAV	O	Spindle control
56	VDD	–	Power supply
57	EXC0	O	33.86MHz
58	EXC1	I	16.93MHz
59	GND	–	Ground
60	TEST	I	Ground
61	PWM1	O	Control the outside spindle motor
62	DCK	O	DSP clock 33.86MHz
63	CCK	O	DSP clock 33.86MHz
64	PWM0	O	Control the outside spindle motor

• **IC609 SCSI CONTROL (SYM53CF92A) (MAIN board)**

Pin No.	Pin Name	I/O	Function
1	VSS	–	Ground
2	DREQ	O	Not used
3	DACK	I	DMA controller
4	DBWR	I	DMA write signal
5	VDD	–	+5V Power supply
6	DB0	I/O	DMA data bus
7	DB1	I/O	DMA data bus
8	DB2	I/O	DMA data bus
9	VSS	–	Ground
10	DB3	I/O	DMA data bus
11	DB4	I/O	DMA data bus
12	DB5	I/O	DMA data bus
13	VSS	–	Ground
14	DB6	I/O	DMA data bus
15	DB7	I/O	DMA data bus
16	DBP	I/O	Odd parity for DB7–0
17	VDD	–	Power supply
18	SD0	I/O	SCSI data signal
19	SD1	I/O	SCSI data signal
20	SD2	I/O	SCSI data signal
21	VSS	–	Ground
22	SD3	I/O	SCSI data signal
23	SD4	I/O	SCSI data signal
24	SD5	I/O	SCSI data signal
25	SD6	I/O	SCSI data signal
26	VSS	–	Ground
27	SD7	I/O	SCSI data signal
28	SDP	I/O	SCSI data signal
29	ATN	I	Schmitt trigger input
30	BSY	O	SCSI output
31	VSS	–	Ground
32	ACK	O	SCSI output
33	RST	O	SCSI output
34	MSG	I/O	SCSI phase signal
35	SEL	I	Selector signal
36	VSS	–	Ground
37	C_D	I/O	SCSI phase signal
38	REQ	O	SCSI output
39	I_O	I/O	SCSI phase signal
40	VDD	–	+5V Power supply
41	MODE	I	Mode selector
42	INT	I	Interrupt status input
43	VSS	–	Ground
44	RESET	I	Reset signal input
45	WR	I	Write signal input
46	RD	I	Read signal input
47	CS	I	Select signal input
48	CLK	I	Clock signal input
49	A0	I	Address inputs
50	A1	I	Address inputs

Pin No.	Pin Name	I/O	Function
51	VSS	–	Ground
52	A2	I	Address inputs
53	A3	I	Address inputs
54	TEST	–	Ground
55	PAD0	I/O	Processor address data
56	PAD1	I/O	Processor address data
57	PAD2	I/O	Processor address data
58	PAD3	I/O	Processor address data
59	VSS	–	Ground
60	PAD4	I/O	Processor address data
61	PAD5	I/O	Processor address data
62	PAD6	I/O	Processor address data
63	PAD7	I/O	Processor address data
64	VDD	–	Power supply

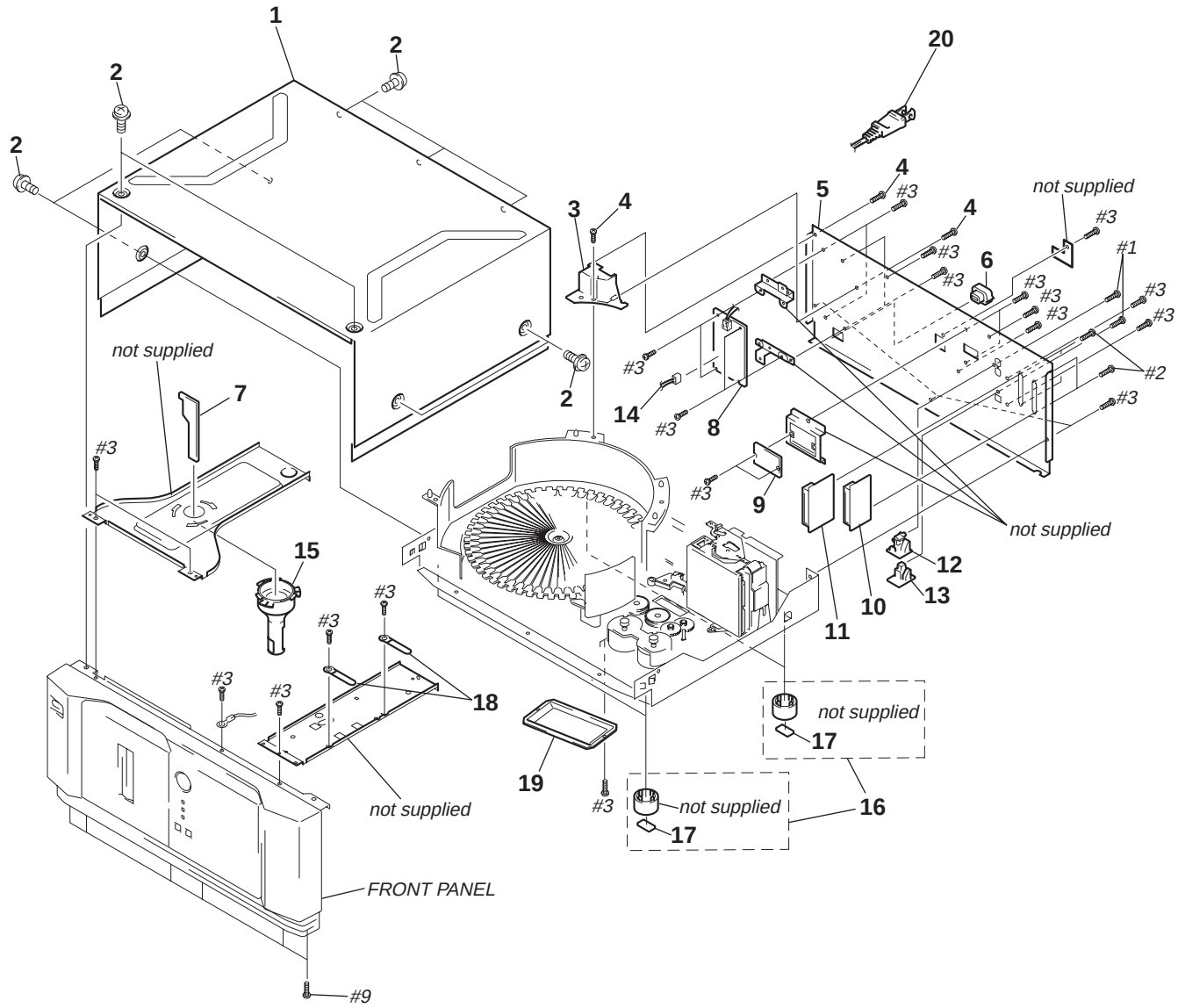
SECTION 8
EXPLODED VIEWS

NOTE:
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  CND : Canadian model

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

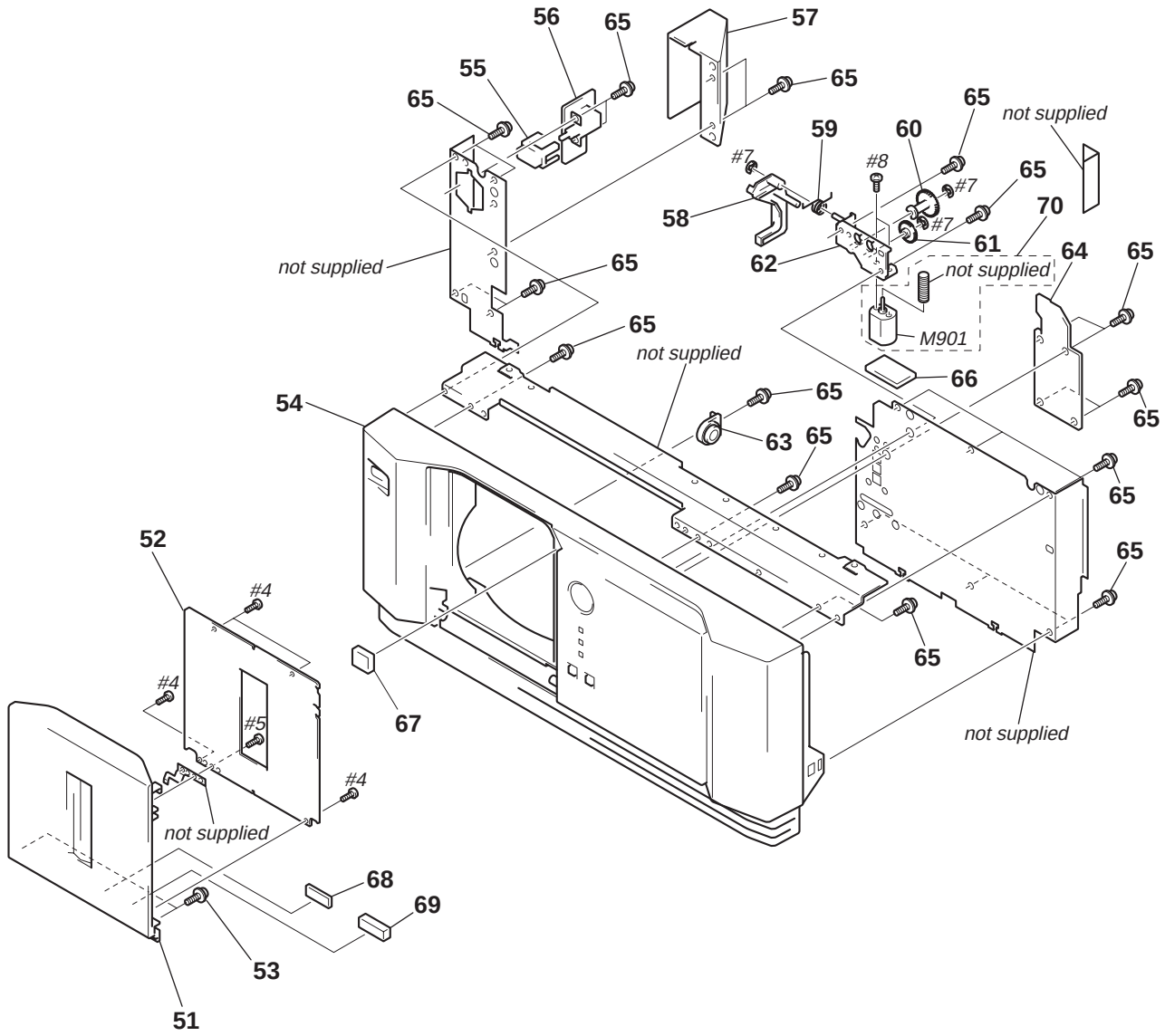
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

8-1. CASE SECTION



Ref. No.	Part No.	Description	Remark
* 1	4-214-126-01	CASE	
2	3-704-366-41	SCREW (CASE) (M3X6)	
* 3	4-214-105-01	COVER (PS)	
4	4-951-620-41	SCREW (2.6), +BVTP	
* 5	4-224-380-01	PANEL, BACK	
6	3-703-244-00	BUSHING (2104), CORD	
* 7	1-672-165-11	LED BOARD	
* 8	1-672-159-11	AC FILTER BOARD	
* 9	1-672-162-11	D.SW BOARD	
* 10	1-672-364-11	SCSI IN BOARD	
* 11	1-672-365-11	SCSI OUT BOARD	
* 12	1-672-161-11	P.JACK BOARD	
* 13	1-672-166-11	DOUT BOARD	
14	1-790-228-11	CORD (WITH CONNECTOR)	
15	X-4948-515-1	ILLUMINATION ASSY	
16	X-4946-543-2	FOOT (SMALL) ASSY	
* 17	4-978-398-21	CUSHION	
* 18	3-703-150-11	CLAMP	
* 19	4-988-534-01	COVER, MOTOR	
20	1-783-531-41	CORD, POWER	

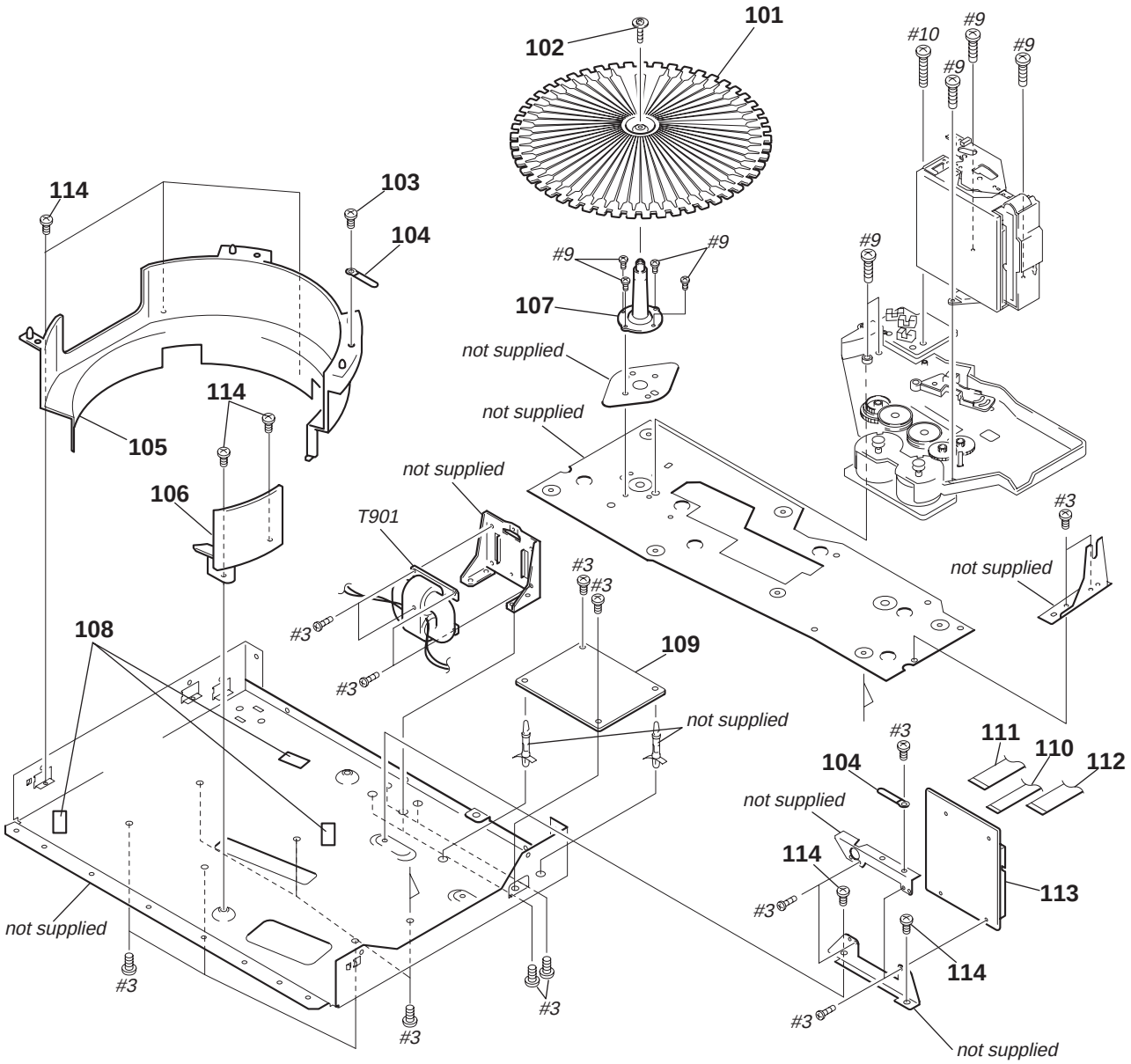
8-2. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
51	X-4950-435-1	DOOR ASSY	
52	4-212-610-01	SHIELD (W)	
53	4-933-134-71	SCREW (+PTPWH M2.6X6)	
54	X-4952-278-1	PANEL ASSY, FRONT	
55	4-212-602-01	BUTTON (POWER)	
* 56	1-672-160-11	P.SW BOARD	
* 57	4-213-893-02	COVER (PW)	
58	4-212-611-01	LEVER (LOCK)	
59	4-212-613-01	SPRING, TORSION	
60	4-212-600-01	GEAR (CAM)	

Ref. No.	Part No.	Description	Remark
61	4-212-612-01	GEAR (A)	
62	X-4950-368-1	BRACKET (DL) ASSY	
63	3-354-963-32	DAMPER	
* 64	A-4724-449-A	KEY (A) BOARD, COMPLETE	
65	4-217-468-01	SCREW (2.6X8)	
* 66	1-672-164-11	DOOR.M BOARD	
67	4-212-818-01	CUSHION (W)	
68	4-212-819-01	CUSHION (B)	
69	4-217-302-01	CUSHION (B2)	
70	X-4951-511-1	DOOR MOTOR ASSY	
* M901	1-541-590-11	MOTOR, DC	

8-3. CHASSIS SECTION

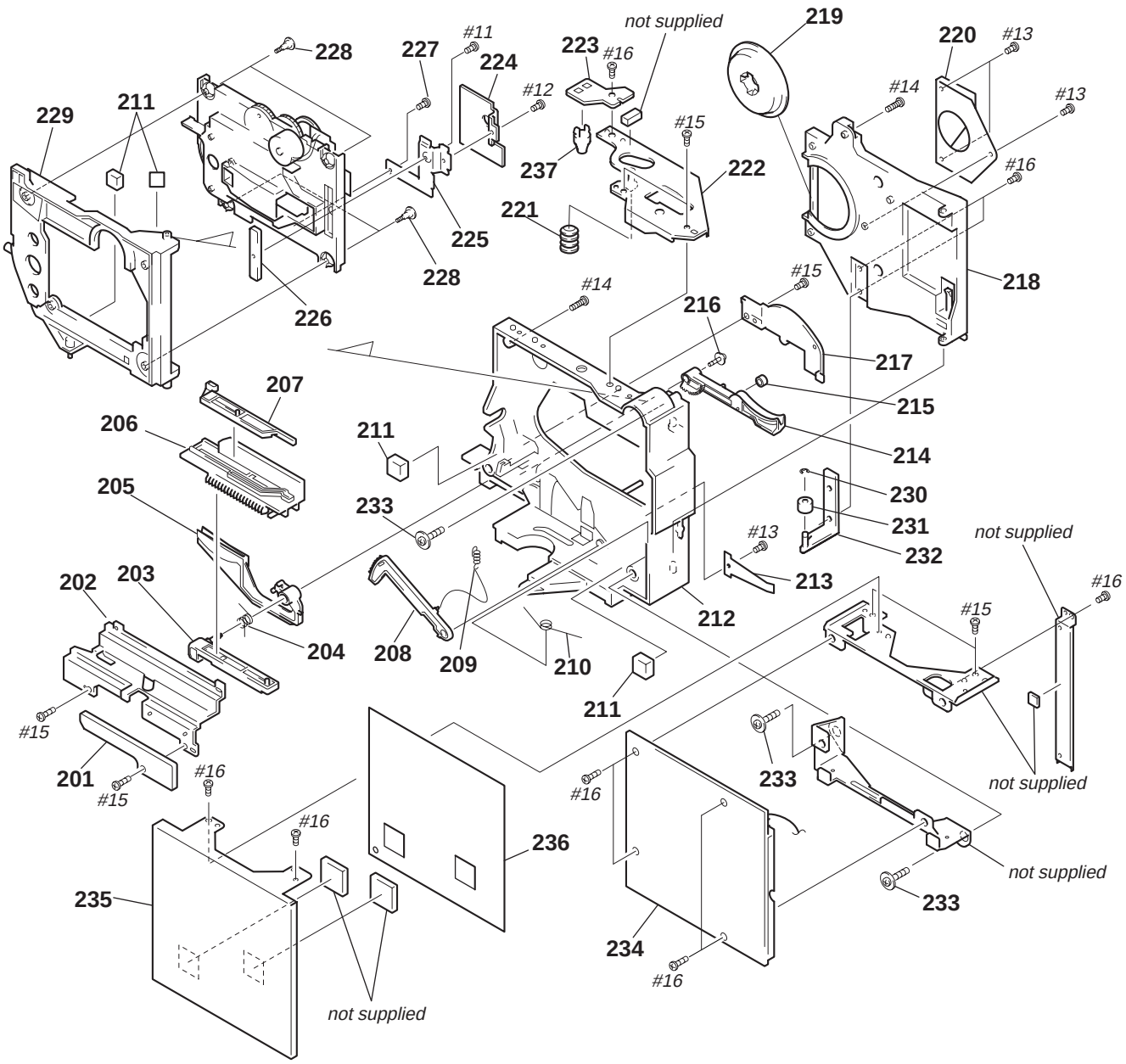


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
101	4-214-144-01	TABLE (50)	
102	4-957-577-11	SCREW PTP WH (2.6X8) (DIA. 10)	
103	4-951-620-41	SCREW (2.6), +BVTP	
* 104	3-703-150-11	CLAMP	
105	4-214-145-01	RING (A)	
106	4-214-107-01	RING (B2)	
107	4-988-439-01	HOLDER, TABLE	

Ref. No.	Part No.	Description	Remark
108	4-214-106-01	CUSHION (RING)	
* 109	A-4724-442-A	POWER (A) BOARD, COMPLETE	
110	1-790-229-11	WIRE (FLAT TYPE) (9 CORE)	
111	1-790-230-11	WIRE (FLAT TYPE) (12 CORE)	
112	1-790-231-11	WIRE (FLAT TYPE) (12 CORE)	
* 113	A-4724-461-A	MAIN BOARD, COMPLETE	
⚠T901	1-433-542-11	TRANSFORMER, POWER	
114	3-970-608-41	+BV SUMITITE (B3)	

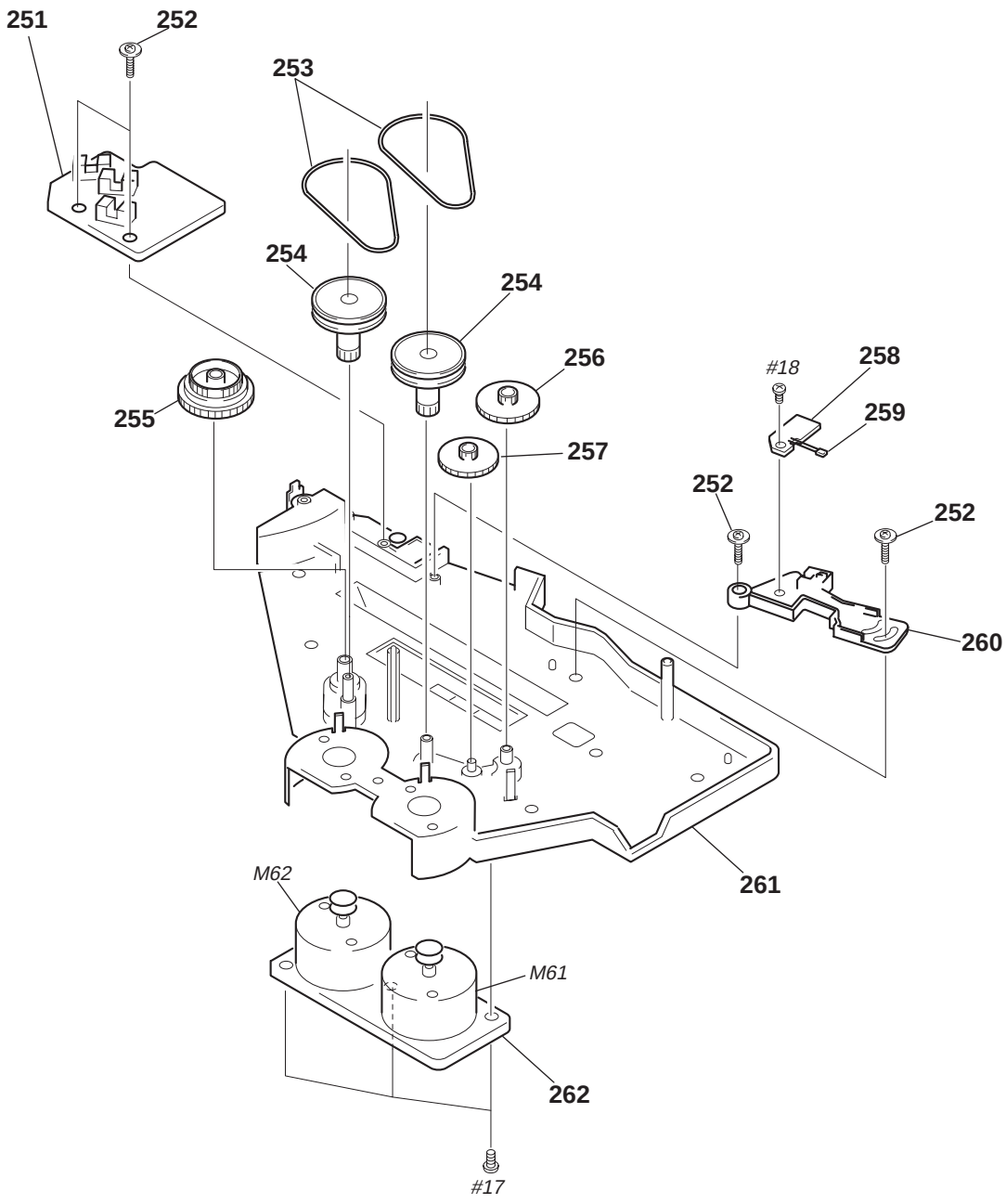
8-4. MECHANISM DECK SECTION-1 (CDM-56)



Ref. No.	Part No.	Description	Remark
* 201	1-672-171-11	CHUCK SW BOARD	
* 202	4-988-427-01	COVER, CAM	
203	4-988-420-01	SLIDER (LOADING)	
204	4-214-140-01	SPRING (LD), TORSION	
205	4-218-013-01	HOLDER (A2), DISC	
* 206	4-988-417-01	SLIDER (CAM)	
207	4-988-433-01	SLIDER (LOCK)	
208	X-4950-568-1	LEVER (LD) ASSY	
209	4-214-141-01	SPRING (LEVER), TENSION	
210	4-214-120-01	SPRING, HOLDER RETURN	
211	4-214-138-01	CUSHION (BU)	
212	4-213-445-01	BASE, LOADING	
213	4-214-117-01	SPRING (BU), LEAF	
214	4-988-419-01	HOLDER (B), DISC	
215	4-988-431-01	ROLLER (DISC)	
216	4-992-069-01	SCREW (+PTPWH) (M2) (DIA. 7)	
* 217	4-988-454-01	COVER (LEVER)	
218	4-213-447-01	HOLDER (MAGNET)	
219	A-4672-779-A	PULLEY ASSY, CHUCKING	

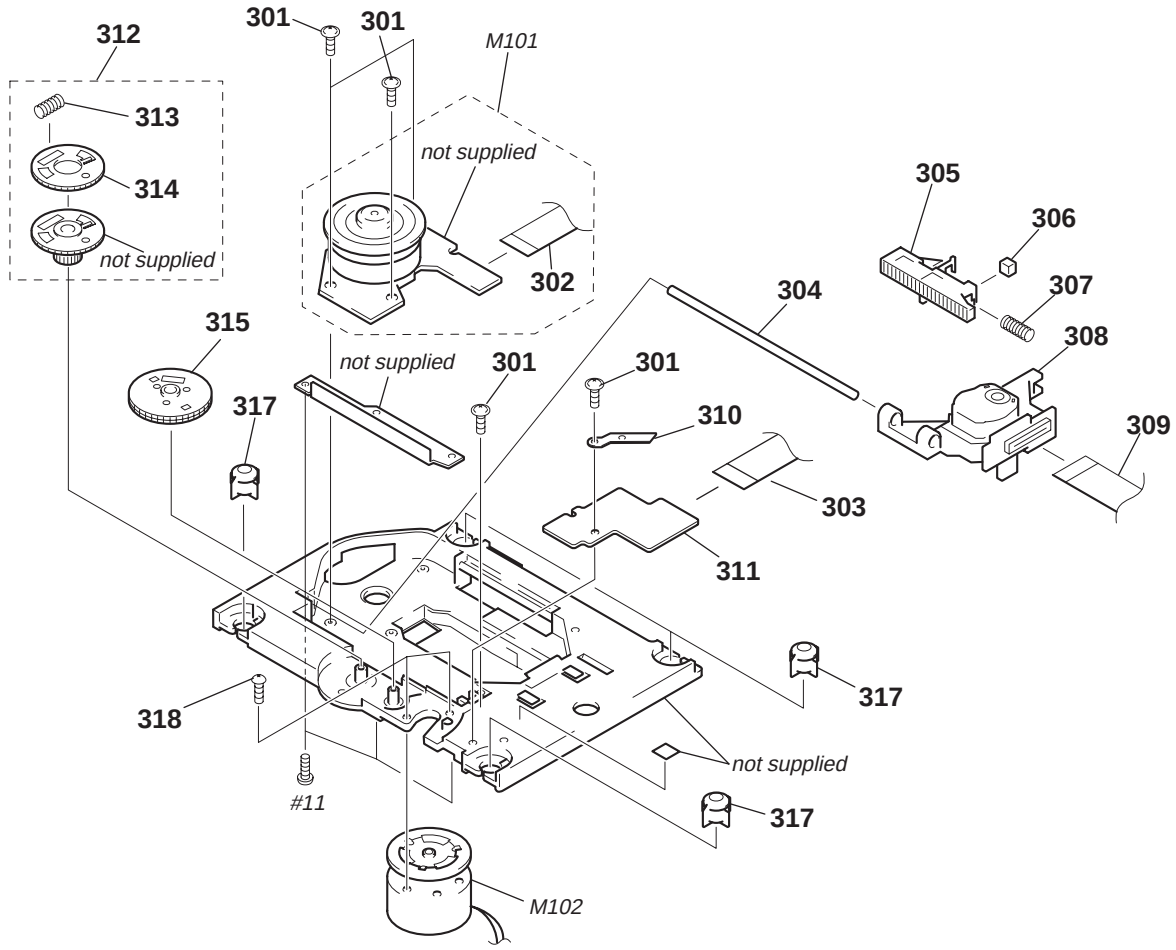
Ref. No.	Part No.	Description	Remark
220	4-214-316-01	COVER (PULLEY)	
221	3-910-095-11	RUBBER, VIBRATION PROOF	
222	X-4950-566-1	BRACKET (DS) ASSY	
* 223	1-672-170-11	DISC SENSOR (S) BOARD	
224	4-214-267-01	BALANCER (K2)	
225	4-214-268-01	BALANCER (K3)	
226	4-214-269-01	BALANCER (K4)	
227	4-974-711-01	SCREW (2X5)(P TYIGHT),(+)PTTWH	
228	4-981-923-01	SCREW (M), STEP	
229	X-4950-567-1	HOLDER ASSY, BU	
230	7-624-101-04	STOP RING 1.2 (E TYPE)	
231	4-214-137-01	ROLLER (MG)	
232	X-4950-569-1	SUPPORT (MG) ASSY	
233	4-957-577-11	SCREW PTP WH (2.6X8) (DIA. 10)	
* 234	A-4724-437-A	MA-C30 (A) BOARD, COMPLETE	
* 235	4-214-119-01	COVER, PC BOARD	
* 236	4-214-118-01	SHEET (CDM)	
* 237	4-976-473-01	HOLDER (LED-S)	

8-5. MECHANISM DECK SECTION-2 (CDM-56)



Ref. No.	Part No.	Description	Remark
* 251	1-672-168-11	TABLE SENSOR BOARD	
252	4-219-823-01	SCREW (+PTPWH 2.6X8 B TYTE)	
253	4-214-143-01	BELT	
254	4-988-425-01	PULLEY	
255	4-988-424-01	GEAR (TABLE)	
256	4-988-423-01	GEAR (A) (LOADING)	
257	4-988-432-01	GEAR (B) (LOADING)	
* 258	1-672-169-11	DISC SENSOR (R) BOARD	
259	8-729-926-31	PHOTO TRANSISTOR PT483F1	
* 260	4-990-669-01	HOLDER (SENSOR)	
* 261	4-988-426-01	BASE (CDM)	
* 262	1-672-167-11	MOTOR BOARD	
M61	X-4591-512-1	MOTOR ASSY (LOADING)	
M62	X-4591-512-1	MOTOR ASSY (TABLE)	

8-6. BASE UNIT SECTION (BU-24)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
301	4-974-711-01	SCREW (2X5) (P TYGHT), (+) PTTWH	
302	1-777-692-11	WIRE (FLAT TYPE) (11 CORE)	
* 304	4-974-724-01	SHAFT (MAIN)	
305	4-992-850-02	GEAR, RACK	
306	4-214-266-01	CUSHION (K)	
307	4-992-851-01	SPRING, COMPRESSION	
⚠308	1-758-088-11	OPTICAL PICK-UP SPU-3212	
309	1-782-368-12	WIRE (FLAT TYPE) (16 CORE)	
* 310	4-214-264-01	PLATE, SHIELD	
* 311	A-4724-441-A	SE-C7 BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remark
312	A-4683-010-A	GEAR ASSY, LIMITTER	
313	4-974-767-01	SPRING, COMPRESSION	
* 314	4-973-786-01	GEAR (S-C1)	
315	A-4683-012-A	GEAR ASSY (B), LIMITTER	
317	4-993-513-03	INSULATOR (K)	
318	4-974-725-01	SCREW (M1.7X2.5), P	
303	1-790-251-11	WIRE (FLAT TYPE) (11 CORE)	
M101	A-4672-641-A	SPINDLE ASSY (SPINDLE)	
* M102	X-4951-510-1	MOTOR, DC (SLED)	

AC FILTER **CHUCK SW**

D.OUT **D.SW**

SECTION 9
ELECTRICAL PARTS LIST

Note:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: µ , for example:
  uA...: µ A..., uPA...: µ PA..., uPB...: µ PB..., uPC...: µ PC..., uPD...: µ PD...
- CAPACITORS
  uF : µ F
- COILS
  uH : µ H
- Abbreviation
  CND : Canadian model

Ref. No.	Part No.	Description			Remark
*	1-672-159-11	AC FILTER BOARD			
		**********			
		< CAPACITOR >			
⚠C902	1-113-925-11	CERAMIC	0.01uF	20%	250V
⚠C903	1-113-925-11	CERAMIC	0.01uF	20%	250V
⚠C904	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C905	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C906	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C907	1-113-920-11	CERAMIC	0.0022uF	20%	250V
		< CONNECTOR >			
* CN902	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
CN903	1-564-321-00	PIN, CONNECTOR 2P			
* CN904	1-568-226-11	PIN, CONNECTOR 2P			
		< COMPOSITION CIRCUIT BLOCK >			
CP902	1-537-771-21	TERMINAL BOARD, GROUND			
		< FUSE >			
⚠F901	1-532-388-51	FUSE (2A/250V)			
		< FUSE HOLDER >			
FH901	1-533-293-11	FUSE HOLDER			
FH902	1-533-293-11	FUSE HOLDER			
		< TRANSFORMER >			
T902	1-416-321-11	COIL, LINE FILTER			
⚠T901	1-433-542-11	TRANSFORMER, POWER			
**********					
*	1-672-171-11	CHUCK SW BOARD			
		**********			
		< CONNECTOR >			
* CN54	1-568-941-11	PIN, CONNECTOR 3P			
		< SWITCH >			
S51	1-571-958-11	SWITCH, PUSH (1 KEY)(UP)			
S52	1-571-958-11	SWITCH, PUSH (1 KEY)(DOWN)			
**********					

Ref. No.	Part No.	Description			Remark
*	1-672-166-11	D.OUT BOARD			
		**********			
		< CAPACITOR >			
C455	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C456	1-126-964-11	ELECT	10uF	20%	50V
C457	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
* CN452	1-568-941-11	PIN, CONNECTOR 3P			
		< IC >			
IC451	8-749-921-12	IC GP1F32T			
**********					
*	1-672-162-11	D.SW BOARD			
		**********			
		< CAPACITOR >			
C704	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C705	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C706	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C707	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C708	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C709	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C710	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C711	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C712	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C713	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C751	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C752	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C753	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN702	1-779-549-11	CONNECTOR,FFC(LIF(NON-ZIF))12P			
CN703	1-506-481-11	PIN, CONNECTOR 2P			
		< COMPOSITION CIRCUIT BLOCK >			
CP701	1-537-771-21	TERMINAL BOARD, GROUND			
CP702	1-537-771-21	TERMINAL BOARD, GROUND			
		< JUMPER RESISTOR >			
JC701	1-216-295-91	SHORT	0		

Ref. No.	Part No.	Description			Remark
		< SWITCH >			
S706	1-570-598-11	SWITCH, DIP			
S707	1-554-556-00	SWITCH, DIP			
**********					
*	1-672-169-11	DISC SENSOR (R) BOARD			
		**********			
**********					
*	1-672-170-11	DISC SENSOR (S) BOARD			
		**********			
*	4-976-473-01	HOLDER (LED-S)			
		< CONNECTOR >			
* CN53	1-568-951-11	PIN, CONNECTOR 2P			
		< DIODE >			
D51	8-719-055-84	DIODE GL-528VS1			
		< RESISTOR >			
R54	1-259-151-21	CARBON	220	5%	1/4W
**********					
*	1-672-164-11	DOOR MOTOR BOARD			
		**********			
		< CONNECTOR >			
* CN705	1-568-951-11	PIN, CONNECTOR 2P			
**********					
*	A-4724-449-A	KEY BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C701	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C702	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C703	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN701	1-778-720-11	CONNECTOR, FFC/FPC 9P			
		< DIODE >			
D701	8-719-018-46	DIODE SEL3510C-CD (POWER)			
D702	8-719-023-94	DIODE SEL3910A-CD (DRIVE)			
D703	8-719-023-95	DIODE SEL3710K-CD (CHANGER)			
		< TRANSISTOR >			
Q701	8-729-424-08	TRANSISTOR UN2111			
		< RESISTOR >			
R701	1-216-031-00	METAL CHIP	180	5%	1/10W
R702	1-216-033-00	METAL CHIP	220	5%	1/10W
R703	1-216-033-00	METAL CHIP	220	5%	1/10W

Ref. No.	Part No.	Description			Remark
		< SWITCH >			
S701	1-762-149-11	SWITCH, PUSH (1 KEY)(DOOR)			
S702	1-762-936-11	SWITCH, LEVER (DOOR MOTOR)			
S703	1-554-303-21	SWITCH, TACTILE (OPEN)			
S704	1-554-303-21	SWITCH, TACTILE (DISC SKIP -)			
S705	1-554-303-21	SWITCH, TACTILE (DISC SKIP +)			
**********					
*	1-672-165-11	LED BOARD			
		**********			
		< CONNECTOR >			
CN841	1-506-481-11	PIN, CONNECTOR 2P			
		< DIODE >			
D841	8-719-058-17	DIODE LNG401NPYJA			
D842	8-719-058-17	DIODE LNG401NPYJA			
D843	8-719-058-17	DIODE LNG401NPYJA			
		< RESISTOR >			
R841	1-216-029-00	METAL CHIP	150	5%	1/10W
R842	1-216-029-00	METAL CHIP	150	5%	1/10W
R843	1-216-029-00	METAL CHIP	150	5%	1/10W
**********					
*	A-4724-437-A	MA-C30 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C102	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C103	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C104	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C105	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C106	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C107	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C108	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C110	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C111	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C112	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C113	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C114	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C115	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C116	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C118	1-163-087-00	CERAMIC CHIP	4PF		50V
C120	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C121	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C122	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C123	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C124	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C125	1-164-346-11	CERAMIC CHIP	1uF		16V
C126	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C127	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C129	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C130	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C131	1-163-038-91	CERAMIC CHIP	0.1uF		25V

MA-C30

Ref. No.	Part No.	Description			Remark
C132	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C134	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C138	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C139	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C140	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C141	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C142	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C143	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C144	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C145	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C147	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C148	1-126-395-11	ELECT	22uF	20%	16V
C149	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C153	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C154	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C155	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C156	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C157	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C158	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C159	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C160	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C166	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C167	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C168	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C169	1-164-346-11	CERAMIC CHIP	1uF		16V
C170	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C171	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C173	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C176	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C177	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C178	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C179	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C180	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C181	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C182	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C201	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C204	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C205	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C208	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C209	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C210	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C211	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C213	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C214	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C217	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C218	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C219	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C220	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C221	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C222	1-164-346-11	CERAMIC CHIP	1uF		16V
C223	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C224	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C227	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C228	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C229	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C230	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C233	1-115-363-11	CERAMIC CHIP	10uF		10V
C234	1-115-363-11	CERAMIC CHIP	10uF		10V

Ref. No.	Part No.	Description			Remark
C235	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C236	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C238	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C240	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C241	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C242	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C301	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C302	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C303	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C305	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C306	1-164-346-11	CERAMIC CHIP	1uF		16V
C307	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C308	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C309	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C310	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C311	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C312	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C313	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C314	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C315	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C316	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C318	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C319	1-115-565-11	CERAMIC CHIP	2.2uF	10%	10V
C330	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C332	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C333	1-164-346-11	CERAMIC CHIP	1uF		16V
C334	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C335	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C336	1-164-346-11	CERAMIC CHIP	1uF		16V
C340	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C342	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C501	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V
C502	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V
C701	1-126-204-11	ELECT CHIP	47uF	20%	16V
C702	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C703	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C704	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C705	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
* CNJ101	1-770-415-11	CONNECTOR, FFC/FPC 11P			
CNJ102	1-770-674-11	CONNECTOR, FFC/FPC 16P			
* CNJ103	1-770-415-11	CONNECTOR, FFC/FPC 11P			
* CNJ104	1-564-518-11	PLUG, CONNECTOR 3P			
CNJ105	1-770-695-11	CONNECTOR, FFC/FPC 12P			
* CNJ107	1-568-941-11	PIN, CONNECTOR 3P			
* CNJ201	1-770-416-11	PIN, CONNECTOR (PC BOARD) 54P			
		< COMPOSITION CIRCUIT BLOCK >			
CP103	1-690-880-51	LEAD (WITH CONNECTOR)			
		< DIODE >			
D101	8-719-987-69	DIODE DAN217			
D201	8-719-938-75	DIODE SB05-05CP			
D301	8-719-938-75	DIODE SB05-05CP			
D701	8-719-157-42	DIODE RD8.2M-B			

Ref. No.	Part No.	Description			Remark
		< IC >			
IC101	8-759-471-19	IC TA2112FN(EL)			
IC103	8-759-449-84	IC LA6539M-TE-L			
IC104	8-759-701-36	IC NJM3403AM			
IC105	8-759-082-61	IC TC4W53FU			
IC106	8-759-471-18	IC BA6849FP-E2			
IC107	8-759-384-55	IC LA6527N			
IC109	8-759-338-78	IC BA10324AFV-E2			
IC110	8-759-008-67	IC MC14066BF			
IC111	8-759-338-78	IC BA10324AFV-E2			
IC112	8-759-505-70	IC L2726			
IC201	8-759-471-17	IC TC9449AF(BS,D,24A)			
IC202	8-759-710-79	IC NJM2107F			
IC203	8-759-082-57	IC TC7W04FU			
IC301	8-752-388-69	IC CXD1818R			
IC302	8-759-578-85	IC MSM5416258B-35JDR1			
IC303	8-759-522-95	IC HD6433032SSNM11F			
IC304	8-759-435-26	IC AT29C512-90JC-T			
IC305	8-759-497-15	IC BU6260AKV			
IC501	8-759-259-77	IC PQ20VZ5U			
		< COIL >			
L101	1-414-267-11	INDUCTOR	10uH		
L200	1-414-235-22	INDUCTOR CHIP	0uH		
L201	1-414-235-22	INDUCTOR CHIP	0uH		
L202	1-414-235-22	INDUCTOR CHIP	0uH		
L203	1-414-267-11	INDUCTOR	10uH		
L701	1-500-425-11	FERRITE	0uH		
L702	1-500-425-11	FERRITE	0uH		
		< TRANSISTOR >			
Q101	8-729-101-07	TRANSISTOR	2SB798-DL		
Q102	8-729-107-30	TRANSISTOR	2SC3545-T42		
Q103	8-729-027-39	TRANSISTOR	DTA144TKA-T146		
Q104	8-729-107-30	TRANSISTOR	2SC3545-T42		
Q105	8-729-421-19	TRANSISTOR	UN2213		
Q106	8-729-421-19	TRANSISTOR	UN2213		
Q202	8-729-107-30	TRANSISTOR	2SC3545-T42		
Q203	8-729-216-22	TRANSISTOR	2SA1162-G		
Q205	8-729-107-46	TRANSISTOR	2SC3624A-L15		
Q206	8-729-107-46	TRANSISTOR	2SC3624A-L15		
Q207	8-729-421-19	TRANSISTOR	UN2213		
Q701	8-729-421-22	TRANSISTOR	UN2211		
Q702	8-729-926-85	TRANSISTOR	2SB1424-T101-Q		
		< RESISTOR >			
R100	1-216-625-11	METAL CHIP	82	0.5%	1/10W
R101	1-216-610-11	METAL CHIP	20	0.50%	1/10W
R102	1-216-610-11	METAL CHIP	20	0.50%	1/10W
R103	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R104	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R105	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R106	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R107	1-216-693-11	METAL CHIP	56K	0.5%	1/10W
R108	1-216-001-00	METAL CHIP	10	5%	1/10W
R109	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W

Ref. No.	Part No.	Description			Remark
R110	1-216-657-11	METAL CHIP	1.8K	0.5%	1/10W
R111	1-216-671-11	METAL CHIP	6.8K	0.5%	1/10W
R112	1-216-001-00	METAL CHIP	10	5%	1/10W
R113	1-216-001-00	METAL CHIP	10	5%	1/10W
R114	1-216-001-00	METAL CHIP	10	5%	1/10W
R115	1-216-001-00	METAL CHIP	10	5%	1/10W
R118	1-216-295-91	SHORT	0		
R119	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R120	1-216-295-91	SHORT	0		
R121	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R122	1-216-001-00	METAL CHIP	10	5%	1/10W
R123	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R124	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R125	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R126	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R127	1-216-668-11	METAL CHIP	5.1K	0.5%	1/10W
R129	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R130	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W
R131	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R132	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R133	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R139	1-216-025-91	RES,CHIP	100	5%	1/10W
R140	1-216-033-00	METAL CHIP	220	5%	1/10W
R141	1-220-745-11	RES,CHIP	0.56	5%	1/2W
R142	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R143	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R144	1-218-756-11	METAL CHIP	150K	0.50%	1/10W
R145	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R146	1-218-764-11	METAL CHIP	330K	0.50%	1/10W
R149	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R150	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R151	1-218-764-11	METAL CHIP	330K	0.50%	1/10W
R152	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R153	1-218-758-11	METAL CHIP	180K	0.50%	1/10W
R155	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R156	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R157	1-218-754-11	METAL CHIP	120K	0.50%	1/10W
R158	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R161	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R163	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R164	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R166	1-220-149-11	REGISTER	2.2	10%	1/2W
R167	1-220-149-11	REGISTER	2.2	10%	1/2W
R168	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R169	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R171	1-216-295-91	SHORT	0		
R174	1-216-295-91	SHORT	0		
R180	1-216-295-91	SHORT	0		
R181	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R182	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R183	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R184	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R186	1-216-121-91	RES,CHIP	1M	5%	1/10W
R187	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R188	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R189	1-216-073-00	METAL CHIP	10K	5%	1/10W
R191	1-216-073-00	METAL CHIP	10K	5%	1/10W

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Ref. No.	Part No.	Description			Remark
R192	1-216-669-11	METAL CHIP	5.6K	0.5%	1/10W
R193	1-216-669-11	METAL CHIP	5.6K	0.5%	1/10W
R194	1-216-669-11	METAL CHIP	5.6K	0.5%	1/10W
R195	1-216-669-11	METAL CHIP	5.6K	0.5%	1/10W
R196	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R197	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R198	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R199	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R200	1-216-009-91	RES,CHIP	22	5%	1/10W
R201	1-216-033-00	METAL CHIP	220	5%	1/10W
R203	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R204	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R205	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R206	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R207	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R208	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R209	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R210	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R211	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R212	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R213	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R214	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R215	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R216	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R217	1-216-033-00	METAL CHIP	220	5%	1/10W
R218	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R219	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R221	1-216-295-91	SHORT	0		
R222	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R223	1-216-041-00	METAL CHIP	470	5%	1/10W
R224	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R226	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R227	1-216-041-00	METAL CHIP	470	5%	1/10W
R228	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R229	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R230	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R231	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R232	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R234	1-216-665-11	METAL CHIP	3.9K	0.5%	1/10W
R235	1-216-665-11	METAL CHIP	3.9K	0.5%	1/10W
R236	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R237	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R238	1-216-089-91	RES,CHIP	47K	5%	1/10W
R239	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R240	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R241	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R242	1-216-033-00	METAL CHIP	220	5%	1/10W
R243	1-218-760-11	METAL CHIP	220K	0.50%	1/10W
R244	1-216-695-11	METAL CHIP	68K	0.5%	1/10W
R245	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R247	1-216-121-91	RES,CHIP	1M	5%	1/10W
R249	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R250	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R251	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W
R256	1-216-097-91	RES,CHIP	100K	5%	1/10W
R257	1-216-097-91	RES,CHIP	100K	5%	1/10W
R308	1-216-001-00	METAL CHIP	10	5%	1/10W
R310	1-216-073-00	METAL CHIP	10K	5%	1/10W
R311	1-216-033-00	METAL CHIP	220	5%	1/10W
R316	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R318	1-216-025-91	RES,CHIP	100	5%	1/10W
R319	1-216-025-91	RES,CHIP	100	5%	1/10W
R320	1-216-025-91	RES,CHIP	100	5%	1/10W
R321	1-216-025-91	RES,CHIP	100	5%	1/10W
R322	1-216-001-00	METAL CHIP	10	5%	1/10W
R323	1-216-001-00	METAL CHIP	10	5%	1/10W
R330	1-216-009-91	RES,CHIP	22	5%	1/10W
R331	1-216-009-91	RES,CHIP	22	5%	1/10W
R333	1-216-089-91	RES,CHIP	47K	5%	1/10W
R334	1-216-073-00	METAL CHIP	10K	5%	1/10W
R335	1-216-089-91	RES,CHIP	47K	5%	1/10W
R336	1-216-033-00	METAL CHIP	220	5%	1/10W
R337	1-216-089-91	RES,CHIP	47K	5%	1/10W
R338	1-216-113-00	METAL CHIP	470K	5%	1/10W
R340	1-216-033-00	METAL CHIP	220	5%	1/10W
R341	1-216-033-00	METAL CHIP	220	5%	1/10W
R342	1-216-033-00	METAL CHIP	220	5%	1/10W
R343	1-216-113-00	METAL CHIP	470K	5%	1/10W
R344	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R345	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R346	1-216-089-91	RES,CHIP	47K	5%	1/10W
R347	1-216-667-11	METAL CHIP	4.7K	0.5%	1/10W
R349	1-216-033-00	METAL CHIP	220	5%	1/10W
R350	1-216-033-00	METAL CHIP	220	5%	1/10W
R351	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R352	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R355	1-216-089-91	RES,CHIP	47K	5%	1/10W
R356	1-216-089-91	RES,CHIP	47K	5%	1/10W
R358	1-216-049-91	RES,CHIP	1K	5%	1/10W
R359	1-216-049-91	RES,CHIP	1K	5%	1/10W
R401	1-216-049-91	RES,CHIP	1K	5%	1/10W
R502	1-216-295-91	SHORT	0		
R701	1-216-073-00	METAL CHIP	10K	5%	1/10W
R702	1-220-262-11	RES,CHIP	680	5%	1/4W
R703	1-218-618-11	METAL CHIP	22	5%	1W
R704	1-218-618-11	METAL CHIP	22	5%	1W
R705	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R706	1-216-651-11	METAL CHIP	1K	0.5%	1/10W

< COMPOSITION CIRCUIT BLOCK >

RB301	1-233-578-11	RES, CHIP NETWORK 47K
RB302	1-233-576-11	RES, CHIP NETWORK 100
RB303	1-236-908-11	RES, CHIP NETWORK 10K (3216)
RB304	1-236-908-11	RES, CHIP NETWORK 10K (3216)
RB305	1-233-578-11	RES, CHIP NETWORK 47K
RB306	1-233-578-11	RES, CHIP NETWORK 47K

< VIBRATOR >

X201	1-767-382-11	OSCILLATOR, CERAMIC (40MHz)
X301	1-767-382-11	OSCILLATOR, CERAMIC (40MHz)
X302	1-579-834-11	VIBRATOR, CRYSTAL (33.86MHz)

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Ref. No.	Part No.	Description			Remark
*	A-4724-461-A	MAIN BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C601	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C602	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C603	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C604	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C605	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C606	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C607	1-126-394-11	ELECT CHIP	10uF	20%	16V
C608	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C609	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C610	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C611	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C612	1-126-396-11	ELECT CHIP	47uF	20%	16V
C614	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C615	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C616	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C617	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C618	1-126-394-11	ELECT CHIP	10uF	20%	16V
C619	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C620	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C621	1-126-396-11	ELECT CHIP	47uF	20%	16V
C622	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
		< CONNECTOR >			
* CN601	1-568-951-11	PIN, CONNECTOR 2P			
CN602	1-770-640-11	CONNECTOR, FFC/FPC 9P			
CN603	1-770-643-11	CONNECTOR, FFC/FPC 12P			
CN604	1-506-468-11	PIN, CONNECTOR 3P			
* CN605	1-568-955-11	PIN, CONNECTOR 6P			
CN606	1-506-469-11	PIN, CONNECTOR 4P			
* CN608	1-568-951-11	PIN, CONNECTOR 2P			
CN609	1-506-469-11	PIN, CONNECTOR 4P			
CN611	1-770-643-11	CONNECTOR, FFC/FPC 12P			
* CN612	1-770-416-11	PIN, CONNECTOR (PC BOARD) 54P			
		< IC >			
IC601	8-759-040-83	IC BA6287F			
IC602	8-759-569-86	IC uPD784031GC-8BT			
IC603	8-759-356-03	IC BA6780			
IC604	8-759-926-80	IC SN74HC573BNS			
IC605	8-759-926-11	IC SN74HC138ANS			
IC606	8-759-927-72	IC TL1591CP			
IC607	8-759-587-80	IC SST29EE010-90-4C-NH-1.00			
IC608	8-759-634-43	IC M51953BFP			
IC609	8-759-384-47	IC SYM53CF92A-64QFP			
IC610	8-759-497-29	IC uPD43256BGU-70LL-E2			
		< COIL >			
L601	1-414-235-22	INDUCTOR CHIP	0uH		
L602	1-500-202-11	FERRITE	0uH		
L603	1-500-202-11	FERRITE	0uH		
		< TRANSISTOR >			
Q601	8-729-107-46	TRANSISTOR 2SC3624A-L15			

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R601	1-216-041-00	METAL CHIP	470	5%	1/10W
R602	1-216-041-00	METAL CHIP	470	5%	1/10W
R603	1-216-073-00	METAL CHIP	10K	5%	1/10W
R604	1-216-085-00	METAL CHIP	33K	5%	1/10W
R605	1-216-073-00	METAL CHIP	10K	5%	1/10W
R606	1-216-073-00	METAL CHIP	10K	5%	1/10W
R607	1-216-073-00	METAL CHIP	10K	5%	1/10W
R608	1-216-073-00	METAL CHIP	10K	5%	1/10W
R609	1-216-073-00	METAL CHIP	10K	5%	1/10W
R610	1-216-073-00	METAL CHIP	10K	5%	1/10W
R611	1-216-073-00	METAL CHIP	10K	5%	1/10W
R612	1-216-073-00	METAL CHIP	10K	5%	1/10W
R613	1-216-073-00	METAL CHIP	10K	5%	1/10W
R614	1-216-073-00	METAL CHIP	10K	5%	1/10W
R615	1-216-073-00	METAL CHIP	10K	5%	1/10W
R616	1-216-073-00	METAL CHIP	10K	5%	1/10W
R617	1-216-073-00	METAL CHIP	10K	5%	1/10W
R618	1-216-033-00	METAL CHIP	220	5%	1/10W
R619	1-216-033-00	METAL CHIP	220	5%	1/10W
R620	1-216-033-00	METAL CHIP	220	5%	1/10W
R621	1-216-073-00	METAL CHIP	10K	5%	1/10W
R622	1-216-073-00	METAL CHIP	10K	5%	1/10W
R623	1-216-073-00	METAL CHIP	10K	5%	1/10W
R624	1-216-073-00	METAL CHIP	10K	5%	1/10W
R625	1-216-073-00	METAL CHIP	10K	5%	1/10W
R626	1-216-073-00	METAL CHIP	10K	5%	1/10W
R627	1-216-073-00	METAL CHIP	10K	5%	1/10W
R628	1-216-079-00	METAL CHIP	18K	5%	1/10W
R629	1-216-068-00	METAL CHIP	6.2K	5%	1/10W
R630	1-216-073-00	METAL CHIP	10K	5%	1/10W
R631	1-216-033-00	METAL CHIP	220	5%	1/10W
R632	1-218-603-91	METAL CHIP	1.2	5%	1W
R633	1-218-603-91	METAL CHIP	1.2	5%	1W
R634	1-216-033-00	METAL CHIP	220	5%	1/10W
R635	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R636	1-216-025-91	RES,CHIP	100	5%	1/10W
R637	1-216-073-00	METAL CHIP	10K	5%	1/10W
R638	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R639	1-216-033-00	METAL CHIP	220	5%	1/10W
R640	1-216-073-00	METAL CHIP	10K	5%	1/10W
R641	1-216-073-00	METAL CHIP	10K	5%	1/10W
		< COMPOSITION CIRCUIT BLOCK >			
RB601	1-233-414-11	RES, CHIP NETWORK 4.7K (3216)			
RB602	1-233-414-11	RES, CHIP NETWORK 4.7K (3216)			
RB603	1-236-908-11	RES, CHIP NETWORK 10K (3216)			
RB604	1-236-908-11	RES, CHIP NETWORK 10K (3216)			
RB605	1-236-908-11	RES, CHIP NETWORK 10K (3216)			
RB606	1-236-908-11	RES, CHIP NETWORK 10K (3216)			
RB607	1-236-908-11	RES, CHIP NETWORK 10K (3216)			
		< SWITCH >			
SW601	1-570-313-11	SWITCH, KEY BOARD			
SW602	1-570-313-11	SWITCH, KEY BOARD			

MAIN **MOTOR** **P.JACK** **P.SW** **POWER**

Ref. No.	Part No.	Description			Remark
		< VIBRATOR >			
X601	1-760-225-11	VIBRATOR, CERAMIC			
X602	1-767-325-21	OSCILLATOR, CRYSTAL			
**********					
*	1-672-167-11	MOTOR BOARD			
		**********			
		< CONNECTOR >			
CN61	1-506-469-11	PIN, CONNECTOR 4P			
**********					
*	1-672-161-11	P.JACK BOARD			
		**********			
		< CONNECTOR >			
* CN451	1-564-506-11	PLUG, CONNECTOR 3P			
		< JACK >			
J451	1-770-719-11	JACK, PIN 2P			
		< COIL >			
L451	1-414-235-22	INDUCTOR CHIP	0uH		
L452	1-414-235-22	INDUCTOR CHIP	0uH		
L453	1-414-235-22	INDUCTOR CHIP	0uH		
**********					
*	1-672-160-11	P.SW BOARD			
		**********			
		< CAPACITOR >			
C901	1-113-920-11	CERAMIC	0.0022uF	20%	250V
		< CONNECTOR >			
* CN901	1-568-226-11	PIN, CONNECTOR 2P			
		< SWITCH >			
S901	1-762-581-11	SWITCH, AC POWER PUSH (1 KEY)(ⓘ)			
**********					
*	A-4724-442-A	POWER BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C908	1-125-742-11	ELECT(BLOCK)	12000uF	20%	35V
C911	1-126-965-11	ELECT	22uF	20%	50V
C912	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C913	1-104-666-11	ELECT	220uF	20%	25V
C915	1-126-965-11	ELECT	22uF	20%	50V
C916	1-164-699-11	CERAMIC CHIP	0.0033uF	5%	50V
C917	1-104-666-11	ELECT	220uF	20%	25V
C920	1-126-941-11	ELECT	470uF	20%	25V
C921	1-126-941-11	ELECT	470uF	20%	25V
C922	1-126-951-11	ELECT	470uF	20%	35V

Ref. No.	Part No.	Description			Remark
C923	1-104-666-11	ELECT	220uF	20%	25V
		< CONNECTOR >			
CN905	1-564-321-00	PIN, CONNECTOR 2P			
CN906	1-691-766-11	PLUG (MICRO CONNECTOR) 4P			
CN907	1-691-766-21	PLUG (MICRO CONNECTOR) 4P			
* CN908	1-568-951-11	PIN, CONNECTOR 2P			
* CN909	1-568-951-11	PIN, CONNECTOR 2P			
		< COMPOSITION CIRCUIT BLOCK >			
CP901	1-537-771-21	TERMINAL BOARD, GROUND			
		< DIODE >			
D902	8-719-025-03	DIODE RBA-402-SL			
D903	8-719-210-39	DIODE EC10QS-04			
D904	8-719-210-39	DIODE EC10QS-04			
D905	8-719-210-33	DIODE EC10DS2			
D906	8-719-210-33	DIODE EC10DS2			
D907	8-719-210-33	DIODE EC10DS2			
D908	8-719-210-33	DIODE EC10DS2			
		< FUSE >			
⚠ F904	1-532-388-51	FUSE (2A/250V)			
		< FERRITE BEAD >			
FB901	1-410-397-21	FERRITE BEAD INDUCTOR			
FB902	1-410-397-21	FERRITE BEAD INDUCTOR			
		< FUSE HOLDER >			
FH903	1-533-293-11	FUSE HOLDER			
FH904	1-533-293-11	FUSE HOLDER			
		< IC >			
IC901	8-759-442-83	IC MC34166D2TR4			
IC902	8-759-442-83	IC MC34166D2TR4			
IC903	8-759-245-86	IC TA7912S			
		< COIL >			
L901	1-415-951-11	INDUCTOR	220uH		
L902	1-415-951-11	INDUCTOR	220uH		
		< RESISTOR >			
R901	1-216-073-00	METAL CHIP	10K	5%	1/10W
R904	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R905	1-216-045-00	METAL CHIP	680	5%	1/10W
R906	1-216-073-00	METAL CHIP	10K	5%	1/10W
R907	1-216-105-91	RES,CHIP	220K	5%	1/10W
R910	1-216-073-00	METAL CHIP	10K	5%	1/10W
R911	1-216-089-91	RES,CHIP	47K	5%	1/10W
**********					

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Ref. No.	Part No.	Description			Remark
*	A-4724-441-A	SE-C7 BOARD, COMPLETE			
		**********			
	1-790-251-11	WIRE (FLAT TYPE) (11 CORE)			
		< CAPACITOR >			
C2	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C3	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C4	1-115-156-11	CERAMIC CHIP	1uF		10V
C5	1-115-156-11	CERAMIC CHIP	1uF		10V
		< IC >			
IC1	8-759-702-02	IC NJM062M			
		< RESISTOR >			
R1	1-218-732-11	METAL CHIP	47K	0.50%	1/16W
R2	1-218-732-11	METAL CHIP	47K	0.50%	1/16W
R3	1-218-714-11	METAL CHIP	8.2K	0.50%	1/16W
R4	1-218-752-11	METAL CHIP	330K	0.50%	1/16W
R5	1-218-732-11	METAL CHIP	47K	0.50%	1/16W
R6	1-218-909-11	RES,CHIP	390K	0.50%	1/16W
R7	1-218-716-11	METAL CHIP	10K	0.50%	1/16W
R8	1-218-668-11	METAL CHIP	100	0.50%	1/16W
R9	1-219-570-11	RES,CHIP	10M	5%	1/16W
R10	1-219-570-11	RES,CHIP	10M	5%	1/16W
R11	1-218-738-11	METAL CHIP	82K	0.50%	1/16W
R12	1-218-728-11	METAL CHIP	33K	0.50%	1/16W
		< VIBRATOR >			
X1	1-803-503-21	SENSOR, SHOCK			
**********					
*	1-672-364-11	SCSI IN BOARD			
		**********			
		< CONNECTOR >			
CN681	1-785-592-11	PIN, CONNECTOR (PC BOARD) 50P			
CN682	1-793-168-11	PIN, CONNECTOR (HALF PITCH)50P			
**********					
*	1-672-365-11	SCSI OUT BOARD			
		**********			
		< CAPACITOR >			
C691	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C692	1-126-402-11	ELECT CHIP	2.2uF	20%	50V
		< CONNECTOR >			
CN691	1-785-592-11	PIN, CONNECTOR (PC BOARD) 50P			
CN694	1-793-168-11	PIN, CONNECTOR (HALF PITCH)50P			
		< DIODE >			
D691	8-719-210-39	DIODE EC10QS-04			
		< FUSE >			
F691	1-533-817-21	THERMISTOR			

Ref. No.	Part No.	Description			Remark
		< IC >			
IC691	8-759-464-52	IC BH9598FP-YE2			
		< RESISTOR >			
R691	1-216-073-00	METAL CHIP	10K	5%	1/10W
**********					
*	1-672-168-11	TABLE SENSOR BOARD			
		**********			
		< CONNECTOR >			
* CN51	1-568-944-11	PIN, CONNECTOR 6P			
CN52	1-506-481-11	PIN, CONNECTOR 2P			
		< IC >			
IC51	8-749-924-18	IC PHOTO INTERRUPTER RPI-1391			
IC52	8-749-924-18	IC PHOTO INTERRUPTER RPI-1391			
IC53	8-749-924-18	IC PHOTO INTERRUPTER RPI-1391			
		< RESISTOR >			
R51	1-216-047-91	RES,CHIP	820	5%	1/10W
R52	1-216-047-91	RES,CHIP	820	5%	1/10W
R53	1-216-047-91	RES,CHIP	820	5%	1/10W
**********					
		MISCELLANEOUS			
		**********			
14	1-790-228-11	CORD (WITH CONNECTOR)			
⚠21	1-783-531-41	CORD, POWER			
110	1-790-229-11	WIRE (FLAT TYPE) (9 CORE)			
111	1-790-230-11	WIRE (FLAT TYPE) (12 CORE)			
112	1-790-231-11	WIRE (FLAT TYPE) (12 CORE)			
259	8-729-926-31	PHOTO TRANSISTOR PT483F1			
303	1-777-692-11	WIRE (FLAT TYPE) (11 CORE)			
308	1-758-088-11	OPTICAL PICK-UP SPU-3212			
309	1-782-368-12	WIRE (FLAT TYPE) (16 CORE)			
M61	X-4951-512-1	MOTOR ASSY (SPINDLE)			
M62	X-4951-512-1	MOTOR ASSY (LOADING)			
M101	A-4672-641-A	SPINDLE ASSY (TABLE)			
* M102	X-4951-510-1	MOTOR, DC (SLED)			
⚠T901	1-433-542-11	TRANSFORMER, POWER			
**********					
		ACCESSORIES & PACKING MATERIALS			
		**********			
	1-761-178-11	BOARD, SCSI			
	1-790-517-11	CORD, CONNECTION			
	1-790-661-11	CORD, CONNECTION (SCSI)			
	3-867-854-11	MANUAL, INSTRUCTION (ENGLISH)			
	3-866-765-11	MANUAL (CD-ROM), INSTRUCTION (ENGLISH)			
	4-214-059-01	LABEL (DISC)			
**********					

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Ref. No.	Part No.	Description	Remark
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#2	7-682-135-01	SCREW +P 2.5X6	
#3	7-685-871-01	SCREW +BVTT 3X6 (S)	
#4	7-685-104-14	SCREW +P 2X6 TYPE2 SLIT	
#5	7-621-772-18	SCREW +B 2X4	
#7	7-624-105-04	STOP RING 2.3, TYPE -E	
#8	7-621-255-25	SCREW +P 2X4	
#9	7-685-873-09	SCREW +BVTT 3X10 (S)	
#10	7-685-875-09	SCREW +BVTT 3X14 (S)	
#11	7-628-253-00	SCREW +PS 2X4	
#12	7-628-254-15	SCREW +PS 2.6X6	
#13	7-685-102-19	SCREW +P 2X4 NON-SLIT TYPE 2	
#14	7-685-107-11	SCREW +P 2X12 TYPE2 NON-SLIT	
#15	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S	
#16	7-685-862-09	SCREW +BVTT 2.6X6 (S)	
#17	7-685-546-19	SCREW +BTP 3X8 TYPE2 N-S	
#18	7-685-532-19	SCREW +BTP 2.6X5 TYPE2 N-S	

Sony Corporation
Home Audio Company

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